

1961-15

1960 INDEXES

- JOURNALS (Proceedings)
- TRANSACTIONS
- CIVIL ENGINEERING

MAY 1961

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FOREWORD

ABSTRACTS AND INDEXES FOR PROCEEDINGS, VOL. 86, 1960

This index provides a guide to material published in the ASCE Proceedings during 1960. The abstracts indicate what general information can be found in the paper in question. The author index includes the names of authors, co-authors, discussers, and chairmen of the committees preparing the several reports. Subject headings have been restricted as follows:

1. Each paper is listed under one primary heading suggested by the name of the Journal in which the paper appeared.

2. A second listing of a paper is made for further refinement of indexing. In the second listing, an attempt is made to index papers of interest to several Divisions under the headings suggested by the Division names.

Discussions can be traced by referral in the author index to the name of the senior author of a paper. Discussion over a period of time can be traced in this fashion until the closing discussion is located.

Typical abbreviations used herein are: Dsc for "discussion," Clo for "closing discussion," Corr for "corrections," and Chmn for "chairman" of a committee submitting a report.

Each entry includes information, in parentheses, that can be used to locate an item that has been indexed. For example,

April EM2:77:2447

would indicate a paper published in the April 1960 Journal of the Engineering Mechanics Division on page 77, as Proceedings Paper 2447.

In the author index the original entry for a paper is supplemented by information concerning the discussion and closure, if applicable. When discussion is published of a paper from a prior year, the original entry is repeated, except that the year of publication is indicated.

Items indexed are identified by months as follows:

MONTH	PAPER NUMBERS	JOURNALS
January	2331-2354	EM1 (Engineering Mechanics), HY1 (Hydraulics), SA1 (Sanitary Engineering), ST1 (Structural).
February	2355-2392	CO1 (Construction), HY2 (Hydraulics), PO1 (Power), SM1 (Soil Mechanics and Foundations), ST2 (Structural), SU1 (Surveying and Mapping).
March	2393-2427	HW1 (Highway), HY3 (Hydraulics), IR1 (Irrigation and Drainage), SA2 (Sanitary Engineering), ST3 (Structural), WW1 (Waterways and Harbors).
April	2428-2459	EM2 (Engineering Mechanics), HY4 (Hydraulics), PO2 (Power), SM2 (Soil Mechanics and Founda- tions), ST4 (Structural).

MONTH	PAPER NUMBERS	JOURNAL
May	2460-2493	AT1 (Air Transport), CP1 (City Planning), CO2 (Construction), HY5 (Hydraulics), SA3 (Sanitary Engineering), ST5 (Structural).
June	2494-2540	EM3 (Engineering Mechanics), HW2 (Highway), HY6 (Hydraulics), IR2 (Irrigation and Drainage), PO3 (Power), SM3 (Soil Mechanics and Foundations), ST6 (Structural), WW2 (Waterways and Harbors).
July	2541-2563	HY7 (Hydraulics), SA4 (Sanitary Engineering), ST7 (Structural), SU2 (Surveying and Mapping).
August	2564-2587	EM4 (Engineering Mechanics), HY8 (Hydraulics), PO4 (Power), SM4 (Soil Mechanics and Foundations), ST8 (Structural).
September	2588-2614	HW3 (Highway), IR3 (Irrigation and Drainage), SA5 (Sanitary Engineering), ST9 (Structural), WW3 (Waterways and Harbors).
October	2615-2636	EM5 (Engineering Mechanics), PO5 (Power), SM5 (Soil Mechanics and Foundations), ST10 (Structural).
November	2637-2667	CO3 (Construction), HY9 (Hydraulics), SA6 (Sanitary Engineering), ST11 (Structural), WW4 (Waterways and Harbors).
December	2668-2697	EM6 (Engineering Mechanics), HW4 (Highway), IR4 (Irrigation and Drainage), SM6 (Soil Mechanics and Foundations), ST12 (Structural).

1960 PROCEEDINGS ABSTRACTS

JANUARY

Journals: Engineering Mechanics, Hydraulics, Sanitary Engineering, Structural

2331. Electrical Analog Computer for Limit Design of Structures, by M. Zaid and F. L. Ryder. (EM) An analog computer capable of minimizing a linear function subject to large numbers of linear inequalities is described. This is the situation customarily encountered in the "limit design" problem. The operation of the computer is described with the aid of the customary n-space geometric analogy.

2332. Comparative Study of a Segmental Arch Ring, by O. C. Zienkiewicz (EM) Three commonly used systems of shell equations are employed to solve the case of hydrostatic pressure acting on a segmental arch ring. The results are compared with solution by classical approach and a modified classical approach. Serious limitations of Donnell's equations are discovered and the nature of the differences between Flügge's and Timoshenko's equation elucidated.

2333. Relaxation Theory of Creep of Metals, by Francis H. Ree, Taikyue Ree, and Henry Eyring. (EM) A model is proposed for explaining secondary creep at high temperatures. Applying rate-process theory to this model, an equation for secondary creep rates is derived. This equation is applied with good results to creep of aluminum, aluminum base alloys, and nickel.

2334. Deflection Stability of Frames Under Repeated Loads, by E. P. Popov and R. E. McCarthy. (EM) Experimental results on the behavior of three portal-type structural steel rigid frames are reported. One such frame was subjected to a proportional loading; another, to repeated lateral loading causing alternating plasticity in one of the members;

and the third, to repeated lateral loading causing incremental collapse of the frame.

2335. Early History of Hydrometry in the United States, by Steponas Kulpaila. (HY) The history of hydrometry (stream flow measurements) is reviewed and its achievements in science and engineering are examined.

2336. A New Approach to Local Flood Problems, by Herbert D. Vogel (HY) The paper describes the growing pressures of population and urban growth which increase encroachment on the flood plain, thereby increasing flood damage potential. TVA experience in identifying flood-danger areas of cities and encouraging local action to guide urban development away from these areas is reviewed.

2337. Travelling Loads on Rigid-Plastic Beams, by P. S. Symonds and B. G. Neal. (EM) The problem of a rigid plastic beam crossed by a load too large for the beam to support statically is examined. The major consideration is whether or not there is a critical magnitude of the travelling load, above which the crossing cannot be made at any finite speed without causing total plastic collapse. The present study indicates that a critical load will not be obtained if the mass of the beam is taken into account.

2338. Design of Circular Plates Based on Plastic Limit Load, by L. W. Hu. (EM) Load carrying capacities of circular plates subjected to axially symmetrical loading were determined by plastic analysis. Design charts for nine cases of loading were constructed. An example was given to illustrate the use of the charts for the design of a pressure vessel.

2339. Generalized Distribution Network Head Loss Characteristics, by M. B. McPherson. (HY) The analysis of

complex distribution systems can be expedited by means of principles developed in this paper. Head losses over a wide range of demand and equalizing storage rates can be calculated directly, based on only two or three complete network analyses, under design assumptions employed in normal practice.

2340. The Fourth Root n -f Diagram, by T. Blench. (HY) A friction-factor design diagram, the "fourth root n -f diagram," is presented as an alternative to the Moody Diagram for engineers who prefer to use the Manning equation for the boundary condition called "rough." Essentially, this design diagram is a Moody diagram in which the logarithmic basic phase lines have been linearized, the set of transition curves for one type of boundary material has been replaced by a few samples for several types, the set of linear "rough boundary" lines has been collapsed into one, and a special line has been added to relate Manning's n to roughness height.

2341. Aerobic Metabolism of Potassium Cyanide, by John B. Nesbitt, H. Robert Kohl and Elmer L. Wagner, Jr. (SA) In an activated sludge system, in which no mixed liquor suspended solids were wasted and in which CN⁻ served as the only source of carbon and nitrogen, it was found that (1) more than 99% of the CN⁻ was metabolized, (2) suspended solids were maintained, (3) approximately 98% of the cyanide-carbon was converted to CO₂, and (4) from 75% to 90% of the cyanide-nitrogen was converted to ammonia, nitrite, and nitrate.

2342. Commentary on Plastic Design in Steel: Compression Members, Lynn S. Beedle, chmn. (EM) This paper is the fifth in a series of reports on plastic design deriving from a joint committee of WRC and ASCE. The paper discusses the influence of axial force, column instability, rotation capacity, lateral-torsional buckling and frame instability on the plastic analysis and design of rigid frames. The background of research is described, experimental correlation with theory is given, and approximations for design use are discussed.

2343. Role of Price in the Allocation of Water Resources, by Lawrence G. Hines. (SA) This paper examines the price-cost function in the allocation and utilization of water resources in the United States and analyzes (1) the market valuation process, (2) the factors affecting the determination of municipal water rates, and (3) the shifts of costs that result from different water uses.

2344. Orthogonal Gridworks Loaded Normally to their Planes, by Ignacio Martin and Jose Hernandez. (ST) The torsional rigidity of the bars should be taken into consideration in this solution of a gridwork, since its behavior is similar to a two-way slab. The solution presented for this problem, which generally is highly indeterminate, allows the introduction of prestressing forces. A set of simultaneous slope-deflection-rotations equations is established to be solved by the electronic computers now available. A prestressed concrete deck, 177 ft by 177 ft with beams spaced 10.8 ft apart in each direction, has been solved by this method.

2345. Summary of the Activities of the Column Research Council, by Bruce G. Johnston. (ST) The summary briefly outlines the administrative setup of the Column Research Council, organized in 1944. The work of the council in reviewing world literature on metal compression members is reviewed and it is shown how the various objectives of the council, as originally framed, have been met during the past 15 years.

2346. Continuous Girder Bridge with Variable Moment of Inertia, by Sabri Sami. (ST) The purpose of this presentation is to develop and illustrate a simplified procedure for the analysis of symmetrical two and four-span continuous girder bridges with variable moments of inertia. The method developed consists of substituting values related to the bridge dimensions, proportions and loadings, into formulas giving the magnitudes of the redundants without the necessity of a sign convention. All constants, coefficients, and functions are dimensionless so that any consistent system of dimensions may be used.

FEBRUARY

2347. The Shell Vault of the Exposition Palace, Paris, by Nicolas Esquillan. (ST) General requirements for the structure are given; the preliminary and final designs are described and the function of structural elements is explained; principles of design, strength of materials, allowable stresses and forces affecting the roof design are presented; and the investigation of local and general buckling of the shells, the influence of creep and other factors on the stability of the shell vault are detailed.

2348. Discussion of Proceedings Paper 1879, 1898, 2092, 2094, 2096. (EM) Lawrence P. Johnson, Jr. and Herbert A. Sawyer, Jr. closure to 1879. Charles C. Bowman and Vaughn E. Hansen closure to 1898. Hsuan-Loh Su on 2092. E. Rosenbluth on 2094. A. M. Neville, Keith Jones on 2096.

2349. Discussion of Proceedings Paper 2058, 2079, 2081, 2084, 2126. (HY) Leo L. Burnet on 2058. Raphael G. Kazmann on 2079. F. V. A. Engel, P. Ackers, Nicholas Bilonok. John A. Roberson on 2081. L. L. Weiss on 2084. John B. Herbach on 2126.

2350. Stability Considerations in the Design of Steel Plate Girders, by Charles E. L. Massonnet. (ST) The paper deals with the results of tests conducted on large steel plate girders. Particular consideration is given to the stability requirements of webs and stiffeners of large-scale steel girders. Different combinations of bending and shear are considered.

2351. New Aspects Concerning Inelastic Instability of Steel Structures, by Brune Thurlimann. (ST) This paper was the basis for an oral presentation at the Joint ASCE-IABSE Meeting at the New York Convention, October, 1958. All Joint Meeting papers published in Proceedings or in Civil Engineering will be reprinted in one volume.

2352. Discussion of Proceedings Paper 1930, 2062, 2090. (SA) Conrad P. Straub closure to 1930. Frank D. Masch on 2062. Shuichi Aiba, James J. McKeown and Daniel A. Okun on 2090.

2353. Discussion of Proceedings Paper 1815, 1837, 1914, 2218, 2239. (ST) Henry Malter closure to 1815. H. L. Murphy corrections to 1837. D. Y. Fok and Tung Au closure to 1914. Ray W. Clough, Stevens J. Fenves on 2218. Robert F. Borg on 2239.

2354. Torsional Analysis of Suspension Bridge Towers, by Frank Baron and Anthony G. Arioto. (ST) An analytical procedure is presented for determining the moments, shears, and displacements of suspension bridge towers that are subjected to a torque about their longitudinal axes. Numerical examples are given to illustrate the procedure.

Journals: Construction, Hydraulics, Power, Soil Mechanics and Foundations, Structural, Surveying and Mapping.

2355. Fundamentals of Arctic Blasting, by Clifton W. Livingston. (CO) The behavior of materials in blasting may be classified into 1) the shock type, 2) the shear type, or 3) the viscous damping type. Blast effects are determined by examining the relation between the energy of the explosion and the mass of the material to which the energy is transferred.

2356. New Tools and Techniques for Dewatering, by Byron J. Frugh. (CO) Description of the use of present day dewatering tools including conventional wellpoints; high-lift systems with ejectors, submersible or turbine pump units; sand drains, and grout curtain walls. Construction job examples of the use of contemporary dewatering tools.

2357. Field Office Bookshelf, by Morton D. Morris. (CO) Every other year Contractors and Engineers publishes a revised bibliography, listing books recommended and suggested for a Field Office Bookshelf. The lists, reviewed and brought up to date, are presented herewith for the information and use of the Construction Division.

2358. Polyvinyl Acetate and Portland Cement Mortars, by Robert T. Howe. (CO) Polyvinyl acetate, offers some promise as an admixture for portland cement mortars. This paper examines polyvinyl acetate and outlines research concerning its possible use in a concrete floor surfacing material.

2359. Control of Ground Water in Excavations, by W. F. Swiger. (CO) This paper presents a review of the basic methods of controlling ground water in excavations. The factors evaluated in selecting a water control system, the methods available, their advantages and disadvantages, and principles of design are discussed.

2360. Epoxy Resin for Structural Repair of Concrete Pavement, by Wilson L. Davis and Eugene Pinkstaff. (CO) This paper describes tests, performed in the North Central Division Laboratory of the Corps of Engineers, in formulating epoxy resins that will satisfactorily repair surface defects in portland cement concrete pavements, that will bond the hardened surfaces of concrete together, and that will bond new concrete to existing concrete.

2361. Prospecting for Thermal Power Plant Sites, by R. A. Elliot. (PO) This paper reviews experiences in the selection of sites for modern stations in the Tennessee Valley Authority power system. Special problems dealing with mapping, foundation explorations, and condenser water systems are described.

2362. Hydrologic Studies by Electronic Computers in TVA, by Willard M. Snyder. (HY) Application of electronic computers in TVA watershed studies is presented. A comprehensive multiple regression analysis program for the IBM 704 computer is described.

2363. Effective Length of Framed Columns, by Thomas C. Kavanagh. (ST) The assumption in many structural specifications that the effective length of columns is equal to the actual length may be extremely conservative in some cases and very hazardous in others. This paper reviews the current state of knowledge relating to effective lengths, and describes the rigorous procedures which permit a rapid selection of the proper effective length for design.

2364. Scales of Viscous Analogy Models for Ground Water Studies, by Jacob Bear. (HY) Scales for viscous fluid models used for studying various problems of flow through porous media are described. Consideration is given to model techniques and limitations. The presentation covers scales for length, time discharge, volume, storage coefficient, two liquid flows, and capillary effects.

2365. Self-checking Method of Computing Curve Elevations, by Charles M. Lamont. (SU) This paper describes a rapid self-checking method of computing vertical parabolic curve elevations, using the conventional type mechanical calculating machine.

2366. Boundary Layer Stimulation in Rectangular Conduits, by R. G. Cox and F. L. Bauer. (HY) The effects of artificial stimulation of the turbulent boundary layer were studied in a 0.283-ft by 0.5 ft plastic conduit. The length of conduit required for fully developed pipe flow was reduced from 18.5-ft to 14-ft by $\frac{1}{4}$ -in. cubes cemented to the conduit entrance curves.

2367. The Calculating Machine in Coordinate Geometry, by Bela Vadasz. (SU) This paper systematizes the solution of common engineering problems in coordinate geometry. Surveying and layout computations, such as intersection, reverse curves, and the three-point problem are analysed and tabulated for solution on conventional calculators.

2368. Dynamic Testing of Pavements, by W. Heukelom and C. R. Foster. (SM) Each time a vehicle passes over a pavement the surface is deflected and rebounds, creating temporary strain conditions for 0.01 to 0.1 sec. Methods used for the dynamic investigation of pavements, base courses, and subgrades are described in the present paper.

2369. Scour at Bridge Crossings, by Emmett M. Laursen. (HY) Relationships are proposed for the prediction of scour at piers and abutments for the case in which sediment is supplied to the scour hole. The relationships were obtained from a combination of an approximate analysis and laboratory experiments, and depend on knowledge of the flow conditions at the bridge site.

2370. Electric Analog for Triangulation Adjustment, by Hsuan-Loh Su. (SU) Various methods based on the principle of electric analogy for triangulation adjustment problems are suggested. It is shown in one of the examples that for a triangulation involving 8 angle equations and 2 side equations, the adjustment problem can be solved by one operator within a few days.

2371. Sediment Transportation and Delta Formation, by E. Kuiper. (HY) This paper gives a description of the regime of the Saskatchewan River in general and the Saskatchewan Delta in particular. Sedimentation computations, carried out in connection with dike design for the Saskatchewan Delta reclamation project, are also presented.

2372. Control of Cracking in TVA Concrete Gravity Dams, by Walter F. Emmons, Olav Lavik and Poul L. Hornby. (PO) This paper outlines the methods used to control cracking of mass concrete in four of TVA's gravity dams. Included are descriptions of cracks observed during and after construction.

2373. Anchored Bulkhead Design by Numerical Method, by F. E. Richart, Jr. (SM) Newmark's numerical method for solving beam problems was used in the classical design procedures for anchored bulkheads. Direct solutions were obtained rapidly and easily by this method, as illustrated by examples.

2374. Trap Efficiency of Reservoirs, Debris Basins, and Debris Dams, by Charlie M. Moore, Walter J. Weed and Graham W. Renfro. (HY) An attempt has been made to review and summarize available information pertaining to trap efficiency and to make it available to the engineers and others in a unified form.

2375. Additional Aspects of the Enrico Fermi Atomic Power Plant, by N. L. Scott and R. F. Mantey. (PO) This paper outlines the unusual structural features of the first commercial fast-neutron reactor power plant. Details of shielding, shielding penetrations, and special construction methods required are presented.

2376. Strategic Aspects of Urban Flood-Plain Occupance, by Gilbert F. White. (HY) The paradox of continuing flood control and rising flood losses is explained in part by elements entering into decisions to change urban flood-plain occupance, 1936-1957. Curbing the mounting toll calls for public action to broaden the range of choice open to managers of flood-plain properties in adjusting to flood hazard.

2377. Discussion of Proceedings Paper 1955, 1959. (CO) David A. Day on 1955. C. H. Oglesby and John Fondahl on 1959.

2378. Airborne Surveying with Doppler Systems, by L. R. Chapman. (SU) Self-contained navigation systems based on the familiar "Doppler effect" provide precise, automatic direction of an aircraft over a pre-determined flight path, with accurate side-lap and over-lap control. The advantages are reflected in better accuracies and lower costs of Doppler survey operations.

2379. Intersection of Straight Line with Spiral, by T. F. Nickerson. (SU) In solving bridges or other structures along spiral curves connecting

tangents with circles, the problem of locating the points of intersection of straight lines with the center-line base spiral and the outer and inner parallel spirals arises. By using the formulas with high-speed electronic digital computers, these intersections may be determined to a high degree of accuracy.

2380. Highway Location and Design by Photogrammetric-Electronic Computer, by S. E. Ridge. (SU) By combining photogrammetric techniques and electronic computers, the engineer is able to locate and design highways with economy and speed. Such equipment allows for a thorough study of the many alternatives available in highway design.

2381. Discussion of Proceedings Paper 1904, 2084, 2085, 2147, 2148, 2149, 2260. (HY) O. A. Johnson and P. B. Boyer on 1904. W. H. Sammons on 2084. R. Hugh Taylor and John F. Kennedy on 2085. Gordon R. Williams on 2147. M. H. Diskin on 2148. Manuel A. Benson and Marcel Bitoun on 2149. T. Blösch on 2260.

2382. Design Pressure for a Reactor Containment Vessel, by J. A. Bailey. (ST) The basis for selection of the magnitude of the reactor accident against which the containment vessel must provide protection is presented, and a limiting accident is analyzed. A numerical example is shown, and generalized curves are included.

2383. The Stone Tower at Newport Speaks, by Edward Adams Richardson. (SU) The Newport Tower, of archeological interest, is investigated for structural design and to determine possible reasons for the window and fireplace arrangement. The design proves adequate, by modern standards, for a particular church structure, while the windows and fireplace form a sophisticated signaling and ship guidance system circa the 14th century.

2384. Properties of Steel and Concrete and the Behavior of Structures, by George Winter. (ST) The aim of this paper is to review, broadly, new findings on materials performance and structural behavior. These findings relate to plastic or inelastic materials properties, and to brittle fracture, fatigue, residual stresses, creep, strength under combined stress, actual versus specified strength, and the like.

2385. Discussion of Proceedings Paper 1842, 2166. (SU) Committee on Highway and Bridge Surveys on 1842. Carl F. Meyers on 2166.

2386. Surveying in the Civil Engineering Curriculum—Panel Discussion—for Education, by Kenneth S. Curtis. (SU) Current curriculum revisions toward a stronger basic sciences background will mean less emphasis on the art of engineering, and the new engineer will not be as productive upon graduation. However, he will be better equipped to successfully cope with the complex problems of the future and will eventually yield a greater contribution.

2387. Civil Engineering Curriculum for Federal Surveying and Mapping, by G. C. Tewinkel. (SU) The federal government has historically employed civil engineers in branches concerned with surveying and mapping. In recent years, however, recruitment efforts have fallen short of the necessary levels. The author presents reasons for this turn of events and analyzes curriculum requirements.

2388. Topographic Mapping in Alaska, by Reynold E. Isto. (SU) Alaska has presented many challenges to mappers, and is an opportune proving ground for the development of new and enterprising techniques. An example of Alaskan mapping projects is the Brooks Range Area. Alaskan mapping has been a joint effort of the Geological Survey, Coast and Geodetic Survey, and Department of Defense.

2389. Installation and Operation of Dewatering Systems, by David A. Werblin. (SM) The three principal types of dewatering systems—sumps, wellpoints, and deep wells—are described. Conditions under which each type may be used, and equipment and methods of installation are presented, together with methods of coping with some of the problems that arise in the field.

2390. Discussion of Proceedings Paper 1817, 1910, 1944, 2035, 2065, 2223, 2308. (ST) George S. Vincent on 1817. G. R. Swihart, J. R. Allgood and W. A. Shaw on 1910. Richard H. Bigelow on 2035. E. Y. W. Tsui on 2065. Gerald D. Galletly on 2223. Nat T. Kanarek on 2308.

2391. Discussion of Proceedings Paper 1864, 1937, 1999, 2000, 2001, 2135, 2136, 2137, 2211, 2214, 2215, 2217. (SM) E. Montford Fucik and R. F. Edbrooke on 1864. Philip Keene on 1937. A. W. Taylor on 1999. I. Th. Rosenqvist on 2000. William T. Lambe on 2001. Ralph B. Peck, H. O. Ireland, Clifton E. R. Lawson, Douglas R. Brown, William M. Crawford, Benjamin KOO, Alfred C. Sheer on 2135. Max Suter on 2136. A. A. Eremin on 2137. Edward A. Abdun-Nur on 2211. W. H. Gotolski on 2214. Ralph B. Peck on 2215. Marcel Bitoun and Jorgen Christiansen on 2217.

2392. Discussion of Proceedings Paper 1556, 1737, 1739, 1746, 1947, 2130. (FO) F. W. Scheidenhelm, John B. Snethage, and Arthur N. Vanderlip and G. R. Scott on 1556. I. C. Steele and J. B. Cooke, Karl Terzaghi on 1737. John B. Snethage, F. W. Scheidenhelm and Arthur N. Vanderlip on 1739. Karl Terzaghi on 1746. Walter J. Weyermann on 1748. J. F. Muir on 1947. Kenneth B. Keener on 2130.

MARCH

Journals: Highways, Hydraulics, Sanitary Engineering, Structural, Waterways and Harbors.

2393. Serendipity and the Development of Experimental Meteorology, by Vincent J. Schaefer. (IR) Scientific developments

leading to the discovery of cloud-seeding are described. The difficulties and importance of understanding mountain meteorology are presented. Improvements in forecasting of weather phenomena are to a large extent dependent on such an understanding. The engineer's role in experimental meteorology is explained.

2394. Experiments on Treatment of Summer Cumulus Clouds, by Louis J. Battan and A. Richard Kassander, Jr. (IR) During 1957 and 1958, the University of Arizona carried out a program of cloud-seeding research directed toward the study of the effects of silver-iodide nuclei on supercooled orographic cumuli. Clouds over the Santa Catalina Mountains in southeastern Arizona were studied.

2395. Physical Studies of Santa Barbara Storms, by Theodore B. Smith. (IR) In order to understand the physical effects of cloud-seeding, it is necessary to understand the natural mechanism of precipitation formation and their variations. Present (1960) observing networks are too sparse for an adequate study of existing precipitation processes. Several observing techniques for this purpose have been used during the Santa Barbara Project.

2396. Seeding of West Coast Winter Storms, by Robert D. Elliott. (IR) Weather modification has emerged as an important engineering application of the science of meteorology. This paper describes both the manually operated silver-iodide smoke generator and the remote-controlled generator operated by radio. Finally, the economic effects of cloud-seeding are evaluated.

2397. Seeding of Clouds in Tropical Climates, by Wallace E. Howell. (IR) A synopsis of cloud-seeding experiments shows substantial agreement among experimenters that seeding with spray or hygroscopic particles often dissipates small warm clouds, but often stimulates convective activity and initiates or increases rainfall from clouds that exceed approximately 4,000 ft in depth, increasing rainfall 50% or more; while seeding with dry-ice or silver-iodide, for effect in super-

cooled clouds appears to produce a smaller but still considerable precipitation increase. A new model of convective cloud fields is proposed.

2398. Generator Technology for Cloud-Seeding, by D. M. Fuquay. (IR) This paper describes experiences in the development and calibration of solution and string-type silver-iodided generators for use on Project Skyfire lightning studies.

2399. Cloud-Seeding Results in Santa Clara County, by Arnett S. Dennis. (IR) An account is given of a cloud-seeding experiment conducted in Santa Clara County, Calif. during three consecutive winters starting with 1955-56. Analysis of results shows a probable increase of from 15% to 28%, due to cloud-seeding.

2400. Advisory Committee on Weather Control, by Frederic A. Berry. (IR) The investigations of the Advisory Committee on Weather Control are described, as well as its principal findings. The information obtained was of great importance to the field of atmospheric physics and the science of weather modification.

2401. The Nature of Cloud Systems, by Horace R. Byers. (IR) Cloud systems suitable for modification by seeding are described. The mechanisms of precipitation formation and results obtained from seeding various types of clouds are briefly considered.

2402. Physical Properties of Clouds, by Roscoe R. Braham. (IR) To form an idea of the difficulty involved in evaluating cloud-seeding effects, the problem can be compared with the study of human genetics. In the past most seeding effects were indicated by straightforward statistical evaluations. Now more tests, which are popularly called "physical evaluations," are being conducted. Nine of these physical evaluations are presented in this paper.

2403. Evaluation of Seeding Trials, by Arnold Court. (IR) Proper evaluation of a cloud-seeding program, from the customer's standpoint, should be in terms of his desired end product; kilowatts, bushels of grain, or pounds of meat. Failing

this and for the benefit of meteorology, evaluation should cover all possible effects of cloud-seeding: rain intensity, rain temperature, wind-speed, etc.

2404. Natural Variability of Storm, Seasonal, and Annual Precipitation, by Glenn E. Stout. (IR) Statistical evaluations of seasonal and annual rainfall variability are presented. Analyses were made to show the variability of natural rainfall, which may occur among five comparable areas, and to show the differences that may naturally occur between control and target areas. Results are applicable to the design of rain-gage networks.

2405. Weather Modification Program for the Future, by Howard T. Orville. (IR) The present status of weather modification is described and improvements are suggested. Recommendations for research, which would implement those of the Advisory Committee on Weather Control, are included.

2406. The Santa Barbara Project, by Robin R. Reynolds. (IR) California has set up a gigantic project called the California Water Plan, designed to guarantee adequate water for all uses for many years to come. To determine possible effects of weather modification on this plan, a large experiment was set up involving carefully controlled cloud-seeding and evaluation of results.

2407. Russian Water Supply and Treatment Practices, by V. J. Calise and W. A. Homer. (SA) Russia has many lakes, rivers, and streams and, generally, has an abundant water supply. This paper reports on a survey of facilities in Russia and Eastern Europe with emphasis on municipal treatment practices and supplies. Technical literature and reports of visitors to Russia provided the main sources of information.

2408. Diffusion in a Sectionally Homogeneous Estuary, by Richard Kent. (SA) Turbulent diffusion in a well-mixed tidal estuary is considered. A practicable theory is presented from which quantitative predictions of mean pollutant-concentration distributions may be obtained for an estuary characterized by a steady-

state salinity and velocity fields which are considered to vary only on the axial direction.

2409. Physical Characteristics of Drainage Basins, by Bernard L. Golding and Dana E. Low. (HY) Significant physical characteristics of drainage-basins are reviewed and defined in terms of recent usage. A standard procedure for plotting the area-distance curves and area-elevation curves is suggested. A new method for computing various important physical characteristics utilizing the standard area-distance curves, and the modified area-elevation curves is included.

2410. Italian Arch Dam and Model Confirmation, by Guido Oberti. (ST) This paper deals with the interdependence of art, experience, and science in the design of large dams. The use of improved analytical methods and large-scale model tests in determining the static behavior and stability of dams is presented, and the use of models in the preliminary design stage is described. The static characteristics of the principal arched dams in Italy are outlined, and the results of model tests of these dams are given.

2411. Fundamental Considerations in High-Rate Digestion, by Clair N. Sawyer and Jay S. Grumbling. (SA) A comparison of the result obtained in high-rate digestion, using shortened digestion times versus sludge concentration is presented. The importance of fixed solids loadings in relation to mixing problems is described. Concepts of unimolecular and first order reaction kinetics are developed for anaerobic digestion.

2412. Roadbeds on Highways and Airport Runways, by Ira B. Mullis. (HW) The paper is intended as a guide to the rational design and construction of roadbeds for highways and airport runways. The effect of pore space, water content and cohesion of the constituent particles of the roadbed govern its strength. Other properties are secondary ones.

2413. Transmission of Waves Past a Rigid Vertical Thin Barrier, by Robert L. Wiegal. (WW) A theory is presented for the transmission of waves past a rigid vertical thin barrier extending from

above the water surface to some distance below the surface. This theory is based on a consideration of wave power transmission. Laboratory data are presented to show that this theory is useful from the engineering standpoint, but that improvements are desirable.

2414. Hydrodynamic Wave Pressure on Breakwaters, by M. A. Gouda. (WW)

This paper presents a theoretical solution to the problem of determining the hydrodynamic wave pressures on breakwaters. The pressures derived are in close agreement with those obtained by other methods based on observations and experiments, such as those by Luigi, Sainflou, Cagli and Benedit.

2415. Development of Flow in Tank Draining, by David Burgreen. (HY)

A theoretical study is made of the development of velocity with time, when a value at the end of a drain pipe is examined. The true velocity, obtained by considering the fluid inertia, is compared to the velocity obtained by the more well known method, which disregards the fluid inertia and assumes that the draining is governed only by the prevailing head.

2416. Highway Research, by the Committee on Research of the Highway Division (Progress Report). (HW)

This report covers research work in the fields of (a) soil mechanics and foundations, (b) construction and maintenance, (c) structural design, (d) materials, (e) economics, (f) road tests, (g) traffic characteristics, and (h) geometric design as they apply to highway engineering.

2417. Developing Alternative Urban Transportation Systems, by William R. McConochie. (HW) Principles of urban transportation, applying to most large cities, were revealed by a comprehensive study of highway and transit needs of Metropolitan Washington. This paper, based primarily on civil engineering studies, describes costs, advantages and disadvantages of auto-dominant, all-bus, all-rail, and recommended plans for Washington, D. C.

2418. Discussion of Proceedings Paper 1899, 2146. (HW) Miles D. Catton on 1899. Charles E. Carlson on 2146.

2419. Discussion of Proceedings Paper 1976, 2171, 2173, 2175. (WW) J. B. Schijf on 1976. Jose Reis de Carvalho and Daniel Vera-Cruz, William H. Booth, Jr., Francis B. Slichter, Leland B. Jones on 2171. G. B. Fenwick on 2173. W. F. Manning, Nicholas Bilonok, Jerome M. Richolson on 2175.

2420. Canadian Section of the St. Lawrence Seaway, by Lawrence H. Burpee. (WW)

This paper describes the project and summarizes many of the facts relating to the navigation features of the Canadian share of the work. Preliminary facts relating to operation are given.

2421. Design and Construction of Navy's Largest Drydock, by S. P. Zola and P. M. Boothe. (WW)

This paper presents a technical description of the design and construction of the Navy's largest drydock at the Puget Sound Naval Shipyard, Bremerton, Wash. The ever increasing dimensions of naval ships, since World War II, require facilities capable of accommodating this class of vessel.

2422. Waves in Navigation Canals due to Lock Filling, by Hans-Werner Partenscky. (WW)

To allow for the increase in traffic on European canals it became necessary to replace existing locks or to improve efficiency. Such work resulted in the rapid flow of canal water. This paper is concerned with the effect of this flow on structures and ships.

2423. Mean Direction of Waves and of Wave Energy, by Omar J. Lillevang. (WW)

Reliable predictions of erosion/accretion effects of new coastal works are necessary. A vector technique related to wave direction and duration statistics is devised, tested on Santa Barbara historical shoaling records, and demonstrated as a design aid for a small craft harbor plan on a sandy beach of California coast.

2424. Diffusers for Disposal of Sewage in Sea Water, by A. M. Rawn, F. R. Bowerman and Norman H. Brooks. (SA)

This paper includes a history of the ocean outfall system operated at Whites Point, California, by the Los Angeles County Sanitation Districts; an outline of certain techniques developed to predict dilutions of sewage effluent discharged in sea water; a description of the use of multi-port diffusers for improving initial dilution; and a procedure for successful hydraulic design of large diffusers.

2425. Discussion of Proceedings Paper 1984, 2089, 2252. (SA) A. L. Tholin, Clint J. Keifer on 1984. C. H. Lawrence and D. R. Miller on 2089. Ralph Stone on 2252.

2426. Discussion of Proceedings Paper 1935, 1962, 1994, 2085, 2129, 2147, 2148, 2149, 2201, 2310, (HY) Robert G. Cox, Arthur Toeh, Thomas J. Rhone on 1935. Walter L. Moore on 1962. Manuel A. Benson on 1994. Tojiro Ishihara, Yuichi Iwagaki, Yoshiaki Iwasa on 2085. B. Michael and A. R. Gagnon on 2129. Julio Escobar-Fernandez on 2147. A. R. Chamberlain, Nicholas Bilonok on 2148. Steponas Kolu-paila, Israel H. Steinberg, William C. Peterson on 2149. Fred W. Blaisdel on 2201. Michael Amein on 2310.

2427. Discussion of Proceedings Paper 1940, 1943, 2004, 2163. (ST) John A. Sbarounis and Michael P. Gaus on 1940. F. G. Keller on 1943. S. O. Asplund on 2004. A. A. Eremin, Theodore V. Galambos on 2163.

APRIL

Journals: Engineering Mechanics, Hydraulics, Power, Soil Mechanics and Foundations, Structural.

2428. The Impact of Computers on Engineering Education, by Gordon P. Fisher. (ST) The modern electronic computer is having a significant effect on the engineering profession. This effect, naturally, is felt in the engineering schools. In this paper the influence of the computer on (a) curriculum, (b) research, and (c) relations with engineering practice, is examined.

2429. Conservancy Districts as Flood Control Organizations, by Cloyde C. Chambers. (HY) A well designed conservancy district is a valuable organization for developing, constructing and administering a comprehensive water management program for an intrastate watershed. Evidence indicates that this type of organization is well adapted to the solution of flood problems, especially when approached on a drainage area basis.

2430. Furnas Hydroelectric Project, by James W. Libby. (PO) This paper gives background data and describes the general design arrangement of the Furnas Hydroelectric Project, now under construction on the Rio Grande. Ultimately, Furnas will have an installed capacity of 1,200,000 kw, placing it among the world's largest hydroelectric developments.

2431. Soil Structure and the Step-Strain Phenomenon, by D. H. Trollope and C. K. Chan. (SM) Following recent advances in the field of colloid science, a working hypothesis aimed at describing the make-up of stable soil structures has been developed. In the light of this hypothesis, the mechanism of shear failure in soils and their response to long-term sustained and repeated loads has been studied.

2432. Piratininga Steam-Electric Generating Station, by O. L. Hooper and H. M. Estes. (PO) This paper describes the construction of the Piratininga steam-electric generating station and the hydroelectric system of which it forms a part. Particular attention is given to the problems of transportation which are unique to the location.

2433. Distribution of Extreme Winds in the United States, by H. C. S. Thom. (ST) Following previous work, annual extreme wind-speed data for airports in the United States were corrected for anemometer type and reduced to a standard 30-ft elevation. The Fisher-Tippett Type II distribution was fitted, giving 0.50, 0.20, and 0.01 quantiles. Confidence intervals of 0.90 for the quantile isolines, and a nomogram for conversion of quantiles to desired elevations, are developed.

2434. White Noise Representations of Earthquakes, by G. N. Bycroft. (EM) White noise is a suitable representation of earthquake motion. A white-noise source, used in conjunction with an analog computer, is a convenient method of analyzing structures subjected to complex ground motions and of assigning probabilities to the deformations arising. It is suggested that a "standard large earthquake" be represented by "white" ground accelerations having a flat spectral density of 0.75 ft per sec per cps and a duration of $\frac{1}{2}$ min.

2435. Hydroelectric Possibilities and Influence of Load Growth, by S. P. McCasland. (PO) This paper is devoted to the physical and economic enhancement that is imparted to hydroelectric potentialities by expansion of power markets. Emphasis is given to economic improvements which small undeveloped sites derive from increase in demand.

2436. Effect of Floor Systems on Pony Truss Bridges, by Robert M. Barnoff and William G. Mooney. (ST) This paper presents the results of an analytical and experimental study of the effect of floor-system participation on top-chord stresses in pony truss bridges. An analytical method is developed to calculate the increase in top-chord stresses due to floor-system participation. Although the results of the tests apply only to a single-span pony truss bridge model, with continuous stringers, these results can probably be extended to include full-scale bridges.

2437. Dynamic Effects of Earthquakes, by Ray W. Clough. (ST) The principle factors controlling the dynamic response of structures to earthquakes are summarized in this paper, and are related to the lateral force provisions recently recommended by the Structural Engineers Association of California for inclusion in the Uniform Building Code.

2438. A Comparison of Stream Velocity Meters, by F. Wayne Townsend and F. A. Blust. (HY) A description of the U. S. Lake Survey method of making stream flow measurements is given, and comparisons of current velocities simultaneously measured by cup and screw type current meters in the lower Niagara River are presented. The conclusion is that the two types of meters give identical results in Lake Survey flow measurements.

2439. Strength and Efficiency Aspects of Plate Structures, by George Gerard. (EM) Two recent developments that may be of interest in the design of thin-gage metal structures are presented. The first part of the paper is concerned with the compressive-strength analysis of

long flat plates after elastic buckling occurs. The second part of the paper considers the design rather than the analysis of composite stiffened plate structures subject to instability.

2440. Dynamic Analysis of Elasto-Plastic Structures, by Glen V. Berg and Donald A. DaDeppo. (EM) A numerical method is presented for determining, by high-speed digital computer, the response of an elasto-plastic structure of a finite number of degrees of freedom to dynamic loads. Damping, either linear or non-linear, may exist. The method consists of numerical integration combined with a matrix solution for the elasto-plastic constraints. Uniqueness of the elasto-plastic solution is proved.

2441. Discontinuity Stresses in Beams on Elastic Foundation, by Joseph Penzien. (ST) Presented is a method of analysis for obtaining discontinuity stresses in beams on elastic foundation and cylindrical shells, subjected to axisymmetrical loading. Also presented are the solutions of numerous basic cases which provide the necessary numerical constants required in the proposed method of analysis.

2442. Pile Driving Experiences at Port Everglades, by T. J. Lynch. (SM) Material settlements of piles were unusual circumstances which developed during the construction of foundations for the Port Everglades Plant. This paper outlines the soil investigations, the difficulties encountered in the driving of piles, and the pile settlements. Pile-load test data are presented and records of comparative driving with an air hammer and a rated equivalent (30,000 lb-ft) diesel are included.

2443. Effects of Flood Flow on Channel Boundaries, by D. A. Parsons. (HY) Some observations of flood-flow effects on natural stream-channel boundaries are given. The general nature of stream flow and stream channels is also included, with the objective of improvements in the design of channel stabilization measures.

2444. Preliminary Analysis of Continuous Gable Frames, by James W. Gillespie and Jan J. Tuma. (ST) Tables and charts for the preliminary analysis of continuous gable frames are presented. The study is restricted to two, three and four equal-span frames of constant cross section, subjected to uniformly distributed loads. All relationships are based on the assumption of elastic deformation. Numerical examples are given.

2445. Behavior of Buckled Rectangular Plates, by Manuel Stein. (EM) A review is presented of recent work done on the post-buckling behavior of rectangular plates. Theoretical and experimental results, which indicate possible changes in buckle pattern, are given for simply supported plates in longitudinal compression. Results of an analysis of the phenomenon of change in buckle pattern are presented and interpreted. An analysis of the stiffness in shear of a plate buckled in compression is presented.

2446. Design of Prestressed Concrete Beams by Computer, by Joseph J. Bonasia. (ST) This paper illustrates how an electronic digital com-

puter is advantageously used to select and design standard post-tensioned, prestressed concrete beams. Two charts are presented which provide information for the rapid selection of satisfactory beams used as interior stringers in simple span, composite beam highway bridges with AASHTO H20-S16-44 live load. A description of the method of obtaining the required prestressing force and its location for the results obtained is also presented.

2447. Waves and Shocks in Locking and Dissipative Media, by Mario G. Salvadori, Richard Skalak and Paul Weidlinger. (EM) The propagation of stress waves and shocks in various inelastic media are studied for a semi-infinite body loaded at its free surface. The first type of material postulated is a locking medium, which responds elasto-plastically at low stress levels but behaves as a rigid body after it is compressed to a certain maximum strain. The second type of medium studied exhibits a constant modulus of elasticity on initial loading and a second larger on unloading.

2448. Drag Coefficients of Locomotion Over Viscous Soils, by Ervin Hedges and Robert S. Rowe. (SM) Supersaturated viscous mud overlying a hard bottom is often critical to locomotion in many areas. To solve wheel resistance problems, basic principles of hydro-dynamics may be applied. A study of the problem with the purpose of minimizing drag in viscous soils is suggested.

2449. Friction Losses in Lines with Varying Discharge, by David L. Muss. (HY) The determination of friction losses in water mains is complicated by service connections along the line which result in different flows in each section of the pipe. Methods now in use result in errors ranging from -66.9% to +185%. New methods are proposed which would reduce the error to less than 5.5%.

2450. Digest of the Guide to Design Criteria for Metal Compression Members, by Bruce G. Johnston. (ST) Eleven highlights from the forthcoming CRC "Guide to Design Criteria for Metal Compression Members" are presented. These items are, in general, the simpler and less technical aspects of the Guide. They were chosen because they represent contributions to the current status of metal compression member design.

2451. Radioactive Traces in Hydrometeorology, by L. Machta. (HY) Atmospheric motion is studied with the aid of radioactive tracers. Radioactive materials are used to improve the meteorologist's ability to track the path of masses of water in the atmosphere. The most promising tracer seems to be tritium but the large number of sources of tritium complicates its application to hydrological problems.

2452. Sediment Problems of the Lower Colorado River, by Whitney M. Borland and Carl R. Miller. (HY) The closure of Hoover Dam on

the Lower Colorado River and the subsequent construction of other major structures, downstream, instigated a series of river adjustments that have required corrective or protective measures. Some of the major problems which have been encountered are pointed out, methods of rectification and design considerations are discussed, and some of the results that have been obtained are presented. Some probable future river problems are briefly examined.

2453. Commentary on Plastic Design in Steel: Connections, Progress Report No. 6 by the Joint WRC-ASCE Committee on Plasticity Related to Design. (EM) This paper is the sixth in a series of reports on plastic design emanating from a joint committee of WRC and ASCE. It analyzes the behavior of continuous connections used in plastically designed structures, including corner connections, interior beam-to-column connections and tapered and curved haunches.

2454. Commentary on Plastic Design in Steel: Deflections, Progress Report No. 7 of the Joint WRC-ASCE Committee on Plasticity Related to Design. (EM) This paper is the seventh and last in a series of reports on plastic design emanating from a joint committee of WRC and ASCE. It presents the analysis of deflections in the plastic range and points out that deflections at working load of plastically designed structures are not excessive.

2455. Discussion of Proceedings Paper 1990, 2197, 2198, 2220, 2230. (EM) T. V. Galambos and Robert L. Ketter on 1990. Glen V. Berg and Spiro S. Thomaidis, T. K. Caughey, G. W. Housner and D. E. Hudson, O. A. Glogau on 2197. John C. Sprague, H. Norman Abramson on 2198. Bayliss C. McInnis, Steven Likuan Tsai and James R. Sims, Clarence J. Derrick, Glen V. Berg on 2220. M. N. Fialkow on 2230.

2456. Discussion of Proceedings Paper 2148, 2150, 2200, 2224, 2241, 2335, 2336. (HY) W. O. Ree on 2148. Mikio Hino, Takashi Ichiye, Charles G. Gunnerson on 2150. M. B. McPherson, Ernest E. Brodbeck on 2200. A. Thiruvengadam, M. B. McPherson, Warren H. Kohler on 2224. A. Thiruvengadam on 2241. J. W. Johnson on 2335. Bernard L. Golding on 2336.

2457. Discussion of Proceedings Paper 1734, 1946, 2206, 2228, 2286, 2289. (PO) Vilgot Lanner, Torald Mundal on 1734. Clifton W. Bolieau on 1946. Bryant Mather on 2206. John H. Ruskin on 2228. G. S. Sarkaria and O. S. Hom on 2286. Carlos S. Ospina on 2289.

2458. Discussion of Proceedings Paper 1970, 2037, 2218, 2219, 2221, 2222, 2314, 2347, 2350, 2351. (ST) W. H. Munse, K. S. Petersen and E. Chesson, Jr. on 1970. Charles O. Heller on 2037. J. Szabo, E. A. Richards on 2218. C. J. Posey on 2219. A. A. Eremin, Benjamin Koo on 2221. W. H. Munse on 2222. Jan J. Tuma on 2314.

Nicholas Esquillan on 2347. Charles E. L. Massonnet on 2350. Bruno Thurlimann on 2351.

2459. Discussion of Proceedings Paper 2062, 2135, 2210, 2213, 2217. (SM) Frank D. Masch on 2062. Kurt H. Siecke, David M. Greer, R. C. Harlan, Louis J. Goodman and Charles N. Lee, F. H. Kellogg and E. L. Murphree, Jr., Lev Zetlin, Bramlette McClelland, James Chinn on 2135. John A. Focht, Jr., on 2210. P. J. Moore, Gideon Yachin on 2213. H. R. Cedergren, Max Suter on 2217.

MAY

Journals: Air Transport, Construction, City Planning, Hydraulics, Sanitary Engineering, Structural.

2460. Reinforced Concrete Pavements for Airports, by August W. Compton. (AT) The use of properly distributed wire reinforcement in concrete airfield pavements controls cracking, reduces maintenance, and increases service life. As an example of the design method that is proposed, the pavement of the Indianapolis, Ind., Municipal Airport is described.

2461. Charts for Design of Reinforced Concrete Columns by W. H. Gardner, J. and Donald H. Kline. (ST) Curves are presented that enable the designer to determine immediately the necessary size and reinforcement for a given thrust and moment. The curves are based on the ultimate strength of the column section and cover six column sizes for each of three concrete strengths. The curves are directly applicable to square tied columns with eccentricities about one axis.

2462. Apron Design for Light Airplanes, by Kenneth K. Wilde. (AT) This paper presents information for the design of parking aprons for single engine and light twin-engine aircraft. Standard dimensions are suggested for laying out tie-downs, and various geometric configurations are analyzed. The operational functions of the aprons are then reviewed with respect to their needs and to each other.

2463. Aerial Photography in Arctic and Subarctic Engineering, by Robert E. Frost. (AT) The analytical airphoto procedures developed in temperate climates are equally applicable to engineering problems in cold regions. Included are: (1) consideration of the regional environmental aspects of the area, (2) detailed study of the minute characteristics and configurations composing the pattern, and (3) recognition and evaluation of the surface configurations which are the result,

specifically, of permafrost and/or severe frost activity.

2464. Evaluation of Alternative Subway Routes, by B. A. Griffith and H. G. von Cube. (CP) A practical automatic computer method of assigning passenger trips to a proposed traffic facility is outlined, and the report gives the results of applying this method to proposed subway systems in metropolitan Toronto.

2465. Public Transit Improvements in Toronto, by W. F. Irvin. (CP) This article traces the significant transit developments in Toronto during the past century; describes the beginning of the latest phase, as the city turned to rapid transit with the construction of the first subway in Canada on Yonge St.; reports some of the results during the first 5 yr of that initial venture in rapid transit; and tells of plans for further rapid-transit extension during the next decade and beyond.

2466. Epoxy Asphalt Concrete for Airfield Pavements, by W. C. Simpson, H. J. Sommer, R. L. Griffin, and T. K. Miles. (AT) Studies of airfield-pavement problems which arise from the combined effects of heavy loads, fuel spillage, and jet blast have led to the development of a new type of paving material called epoxy asphalt concrete (EAC). Conventional hot-mix asphalt plants and paving equipment are used in its production. The new paving material combines the strength of portland cement concrete with the flexibility of asphaltic concrete.

2467. Airphoto Interpretation for Airfield Site Location, by James H. McLerran. (AT) The principles and procedures of airphoto interpretation are considered. To illustrate the application of airphoto interpretation to airfield site location, an area (Martinsburg, W. Va.) has been selected and an airfield-site-location analysis prepared. From a study of the airphotos three sites were selected, and a comparative analysis is presented.

2468. Design Principles for Underground Salt Cavities, by Shosei Serata and Earnest Gloyna. (SA) Theoretical equilibrium relationships substantiated by experimental studies are presented here for us in the design of salt cavities. Also included are studies on reduction of cavity volume, development of the plastic zone, strength of salt, and physico-chemical effects of waste.

2469. Tolkmitt's Backwater and Dropdown Curve Tables, by R. D. Goodrich. (HY) Tables and formulas are presented for the computation of backwater and dropdown curves for channels of parabolic section. These are followed by caution as to the selection of the coefficients C and n when used in connection with the computation of water-surface curves.

2470. Design Considerations for Fatigue in Timber Structures, by Wayne C. Lewis. (ST) Working stresses for timber are developed from average test values for clear wood by applying factors for normal variability, indeterminacy of stress analysis, natural strength-reducing characteristics present in structural timbers, and duration of loading. Normally, no allowance is made for fatigue. This paper summarizes information now available on fatigue of wood and discusses the adequacy of design based on present-day working stresses with respect to fatigue.

2471. Regional Planning in Cuyahoga County, Ohio, by Alfred A. Estrada. (SA) This paper points out the problems created in the fields of water supply and sewerage by the post-war population boom. The manner in which the problem was studied and the observations made are examined.

2472. Oxygen Balance of an Estuary, by Donald J. O'Connor. (SA) The dissolved-oxygen profile depends on the concentration of the organic material, its rate of oxidation, and the resulting rate of reaeration. The interrelationship among these geophysical and biochemical factors is described by a differential equation under a steady-state condition.

2473. Minimum Cost Design of Large Support Rings, by Kenneth P. Buchert. (ST) This paper suggests a method of design for large support rings. The method proposes that the outer-flange plate of the ring can be eliminated on various sections of the ring without materially affecting the ring stresses. Significant savings in the fabrication cost of the ring can, thus, be realized.

2474. Behavior of Suspensions, by A. W. Bond. (SA) There is a theory of the settling of suspensions in still water and of the behavior of suspensions in an upflow. The theory is examined with experiments on the settling of alum and lime hydroxide floc suspensions, and of their behavior in an expanding upflow. Their behavior is compared in still water and in upflow, and the application of the theory to the precipitates formed in sedimentation basins is discussed.

2475. Rationale for Determining Design Wind Velocities, by A. G. Davenport. (ST) A method is described for determining a basic design wind velocity which can be related to the expected life of the structure and from which other factors, such as the gustiness, can be determined.

2476. Sanitary Engineering Aspects of Nuclear Energy, Progress Report of the Committee on the Sanitary Engineering Aspects of Nuclear Energy of the Sanitary Engineering Division. (SA) The Committee has attempted to summarize and bring into focus a number of interrelated topics dealing with radioactivity. This paper reviews some of the advancements, current areas of interest, and future responsibilities of

the sanitary engineering profession in the nuclear field.

2477. Bar-Chain Method for Analyzing Truss Deformation, by S. L. Lee and P. C. Patel. (ST) An attempt is made to extend the application of the bar-chain method in the analysis of statically determinate and indeterminate trusses. The relationships between the angles of inclination and the unit strains of the members to the actual deflection of the joints, the actual rotation of the members and the equivalent end rotations are established. The application of the method is illustrated by means of numerical examples.

2478. Hood Inlet for Closed Conduit Spillways, by Fred W. Blaisdell. (HY) The capacity and performance of the spillway for variations of the hood inlet length, the conduit slope, the wall thickness, and the approach conditions are described. The great effect of vortices on the spillway capacity is shown and anti-vortex devices are developed, and scour in the vicinity of the hood inlet is determined for various sizes of stone.

2479. Design and Cost Considerations in High Rate Sludge Digestion, by Alfred A. Estrada. (SA) This paper deals with the magnitude of data available and the effectiveness of gas versus mechanical agitation and the lack of data to fix design data for high-rate digestion tanks. Also discussed is the economic aspect.

2480. Influence of Partial Base Fixity on Frame Stability, by Theodore V. Galambos. (ST) The influence of partial base restraint on the buckling strength of rectangular rigid frames is discussed in this paper. It is shown that the rotational restraint offered by commonly used "pinned" column bases is sufficient to increase the buckling strength of these frames to almost that of identical "fixed-base" rigid frames.

2481. Waste Treatment at the Shippingport Reactor, by J. R. La Pointe, W. J. Hahn, and E. D. Harward. (SA) A comparison of the design considerations and initial performance results of the radioactive waste disposal plant at Shippingport is presented. Measuring volumes and activities of various kinds of radioactive wastes during early operation of the Shippingport Atomic Power Station are evaluated in terms of the predicted waste quantities and radioactive levels.

2482. Construction of Morrison Bridge, by R. D. Bane. (CO) Late in 1958, Multnomah County completed a new bridge in Portland, Oreg., at a cost of over \$13,000,000 to cross the Willamette River and to connect through extensive approaches to downtown streets. This article reports on the construction of the 760-ft river bridge and its approach systems.

2483. Photographic Analysis for Construction Operations, by John W. Fondahl. (CO) The obstacles to the study of successful methods of construction operations are examined. An analysis technique using a movie camera to take individual exposures at timed intervals is suggested. Several applications are proposed including methods of improvement, trouble shooting, methods and equipment selection, estimating data, and effective presentation of findings.

2484. Uniform Water Conveyance Channels in Alluvial Material, by Daryl B. Simons and Maurice L. Albertyson. (HY) Methods of designing uniform alluvial channels are developed and illustrated. Special emphasis is given to the modified regime theory. The results of this investigation are based on a field study of stable alluvial irrigation channels, and other existing alluvial channel data which are applicable.

2485. Resistance to Flow in Alluvial Channels, by Daryl B. Simons and E. V. Richardson. (HY) This paper presents the initial results of a flume study of alluvial channels. A detailed classification of the regimes of flow, the forms of bed roughness and the basic concepts pertaining to resistance to flow are discussed.

2486. Discussion of Proceedings Paper 1892, 2189. (AT) Temple A. Tucker on 1892. R. G. Ahlvin on 2189.

2487. Discussion of Proceedings Paper 2055, 2306, 2307. (CP) Harold M. Lewis on 2055. Edward M. Hall on 2306. Charles E. Doell on 2307.

2488. Discussion of Proceedings Paper 1956, 2142. (CO) Robert L. Schiffman on 1956. John A. Pihlainen on 2142.

2489. Discussion of Proceedings Paper 1996, 2020, 2057, 2128, 2149, 2202, 2224, 2241, 2242, 2243, 2245, 2260, 2265, 2239, 2340, 2366, 2369, 2374. (HY) L. Escande, Nicholas L. Bambarossa on 1996. Vito A. Vanoni and George N. Nomicos on 2020. William M. Sangster, Horace W. Wood, Ernest T. Smerdon, and Herbert G. Bossy on 2057. William H. Sammons, C. O. Clark on 2128. Manuel A. Benson on 2149. Robert L. Miller on 2202. E. Roy Tinney, J. W. Robertson and H. W. Bennett on 2224. A. Rylands Thomas on 2241. George N. Newhall and Frank M. Henry on 2242. Alexandre Preissmann on 2243. Robert G. Cox and Ellis B. Pickett, W. P. Simmons, Jr. on 2245. T. Blench, G. H. Lean, Lucien M. Brush, Jr., Don M. Culbertson and Paul R. Jordan, Bruce R. Colby on 2260. J. R. Philip on 2265. E. F. Trunk on 2239. T. Blench on 2340. R. G. Cox and F. L. Bauer on 2366. T. Blench on 2369. Rolland E. Kaser on 2374.

2490. Discussion of Proceedings Paper. 1777, 2090, 2250, 2252, 2343. (SA) Murray Stein on 1777. A. Pasveer, A. L. Downing, W. W. Eckenfelder, Jr. on 2090. Desso T. Mitchell on 2250. Garrett Sloan on 2252. John C. Geyer on 2343.

2491. Discussion of Proceedings Paper 1878, 2223, 2256, 2257, 2262, 2305, 2308, 2314, 2321, 2346. (ST) C. W. Yu and Eivind Hognestad on 1878. Zdenek Sobotka on 2223. Bruno Barbarito and Guiliano Augusti on 2256. A. A. Eremin on 2257. Sven H. Wichman on 2262. Kuang-Han Chu on 2305. Nabi Taskinoglu on 2308. Valeriu Petcu on 2314. Paul Rogers on 2321. Sabri Sami, Keiichi Hayashi, Narbey Khachaturian on 2346.

2492. Planning Activity in the Cleveland Region, by Stephen A. Kaufman. (CP) The Regional Planning Commission has been working steadily, preparing Cuyahoga County's general plan. It has undertaken studies of sewerage and water supply, transportation, population land use, and regional recreation. Because of close working relationships with county and municipal officials, the Commission and staff are having some effect on current developments.

2493. Concrete Addition to Cellular Sheet Pile Shipway, by John W. Irvine and Richard F. Gaston. (CO) A graving dock used as a shipway, and constructed of cellular sheet piling in the early days of World War II, has been lengthened 100 ft. The additional length was provided by sinking a reinforced concrete trapezoidal-shaped cofferdam with the aid of open dredged wells.

JUNE

Journals: Engineering Mechanics, Highway, Hydraulics, Irrigation and Drainage, Power, Soil Mechanics and Foundations, Structural, Waterways and Harbors.

2494. Irrigation and Drainage Problems in Uruguay, by J. E. Christiansen. (IR) Uruguay irrigates about 65,000 acres, mostly rice (74%) and sugar cane (15%). Frequent droughts seriously affect both crops and livestock. Irrigation can be increased by storage in small reservoirs on tributary streams by means of low earth dams.

2495. Heritage of Irrigation in Iraq, by M. R. Lewis. (IR) The history of irrigation in Iraq for 6,000 yr and its influence on the thinking and customs of the people are reviewed. War, floods, excess salts, sedimentation, and changing trade routes are investigated as causes of the decline or abandonment of great irrigation systems.

2496. Review of Research on Composite Steel-Concrete Beams, by I. M. Viest. (ST) Investigations of composite beams carried out in the period 1920-1958 in this country and abroad

included both experimental and theoretical studies. Tests of specimens with and without mechanical connectors are summarized, specimens briefly described, and major results discussed.

2497. Analysis of Frames with Nonlinear Behavior, by Alfredo Hua-Sing Ang. (EM) A method for the analysis of frames with nonlinear behavior subjected to lateral deformations is presented. The nonlinear characteristics of both the members and the connections are considered.

2498. Behavior of Viscoelastic Plates in Bending, by George E. Mase. (EM) This investigation deals with the flexural deformation of linear viscoelastic plates. Solutions of the fundamental equation for such plates are obtained by use of the Laplace transformation with respect to time. The quasi-static deflection under various lateral loadings and the dynamic response under no load are presented.

2499. Aircraft Structural Analysis of an Analog Computer, by W. J. Brignac and R. G. Schwendler. (EM) This paper is a brief description of the technique of representing elastic structures by electric analogs with passive elements.

2500. Vibrations and Stability of Plates Under Initial Stress, by George Herrmann and Anthony E. Armenakas. (EM) A linear theory of motion is established which, in addition to initial membrane forces, takes into account initial moments and transverse shear forces.

2501. Computer Analysis of Slope Stability, by John A. Horn. (SM) A computer program has been written which can solve a great variety of slope stability problems. It is possible to analyze a slope with any surface configuration, with one or two soil strata in any pattern, with or without water table, pore pressures, increasing cohesion with depth, tension cracks, rigid base, or loads anywhere on the surface.

2502. Ultimate Strength of Over-Reinforced Beams, by Ladislav B. Kriz and Seng-Lip Lee. (EM) The flexural strength of rectangular, reinforced concrete beams controlled by compression is investigated analytically, using stress distribution derived from experimental stress-strain curves. Empirical expression for the ultimate bending moment is presented and the calculated moments of 59 test beams which failed in compression are compared with the ultimate test moments.

2503. Cooling Water for Steam Electric Stations on Tidewater, by R. W. Spencer and John Bruce. (PO) A review of the circulating water design features and the operating experience of 18 steam electric stations located on the California coast is presented.

2504. Shock Pressures Exerted by Breaking Waves on Breakwaters, by Shoshichi Nagai. (WW) A study of shock pressures exerted by breaking waves plunging into composite-type breakwaters were studied through the use of a high speed movie camera (3,000 frames per sec), and an electromagnet oscillograph. Formulas for the prediction of the maximum shock pressure

and the maximum resultant pressure per unit of breakwater were derived.

2505. Experimental Study of Beams on Elastic Foundations, by Robert L. Thoms. (EM) The design and use of a structural model for the solution of shear and moment in a beam on an elastic foundation is presented.

2506. Jet Diffusion in Liquid of Greater Density, by G. Abraham. (HY) A study is presented on the influence of the density difference between a jet and the surrounding fluid on the diffusion by a circular, vertical, submerged turbulent jet.

2507. Breakwaters in the Hawaiian Islands, by Robert Q. Palmer. (WW) Breakwaters have been required to create most Hawaiian harbors. Before 1950, the rubble-mound structures were featured by keyed armor stonework. Additional data are needed to develop economical designs.

2508. Containment Studies for an Atomic Power Plant, by William McGuire and Gordon P. Fisher. (PO) A summary of the structural aspects of insuring complete containment for the Enrico Fermi Power Plant in the improbable event of an accident is given. The nature of the critical loading, as well as methods of investigation of structural behavior as a consequence of the loading, is discussed for such emergency conditions.

2509. Structural Engineering Aspects of Nuclear Power Plants, by Lewis L. T. Au and Edward Y. W. Tsui. (ST) A comprehensive description and discussion of structural features in nuclear power plants is presented. Stress analyses in reactor pressure vessels with supports under various loading conditions, and thermal gradients due to convective cooling, are critically reviewed. Effect of dynamic forces and wind on structures is also examined.

2510. Asymmetrical Bending of Conical Shells, by Bayard Wilson. (EM) The equations of Goldenveizer's theory are specialized to the case of conical shells. A method of solution is developed, applicable to truncated cones of finite length, simply supported along two generators, and having any type of support at the ends.

2511. Added Mass of Lenses and Parallel Plates, by Turgut Sarpkaya. (EM) Contained herein is a study of the added mass of lens-shaped bodies, two parallel square plates, and two parallel, infinitely long rectangular plates of various thicknesses. The added masses were determined from a mass-frequency relationship obtained by immersing the objects in water and accelerating them in oscillatory motion. The experimental results are in good agreement with the analytical studies of corresponding potential flows.

2512. Stability Problems of Compressed Steel Members and Arch Bridges, by Georg Wastlund. (ST) The design of compressed steel members (columns) is discussed. Attention is given to the stability of bridge arches in vertical planes, and to the lateral stability of bridge arches

braced with transverse struts. Numerical values of parameters are given and applications to practical cases are shown.

2513. Analyzing and Projecting Travel Data, by Wilbur S. Smith. (HW) Projections of travel desires are essential for good transportation planning. This paper describes a comprehensive application of new techniques in a survey of the Washington, D. C., metropolitan area to determine the projections needed for planning a transportation system for the area.

2514. Translation of Foreign Literature on Hydraulics, Second Progress Report of the Task Force on List of Translations of the Committee on Hydromechanics of the Hydraulics Division. (HY) In 1958, the Committee on Hydromechanics established a Task Force on List of Translations for the purpose of bringing and keeping the original List of Translations of Foreign Literature on Hydraulics, Manual No. 35, up to date. The second addendum to this manual is presented in this paper.

2515. Design of Self-Supported Steel Transmission Towers, by R. N. Bergstrom, J. R. Arena, and J. M. Kramer. (PO) Present tower design practices are reviewed with discussion of existing codes. The economy of using various materials is discussed and the design of a transmission line is outlined, describing how repetitions of the same tower type offer an opportunity to effect considerable savings.

2516. Stresses due to Thermal Gradients in Reactor Shieldings, by Melvin L. Baron and Mario G. Salvadori. (EM) The stresses due to a sudden rise in surface temperature on one side of a fixed-ended arch with a rectangular cross section are evaluated, and the results are extended to the case of a surface temperature which first increases linearly and then remains constant.

2517. Prediction of Maximum Practical Berth Occupancy, by Thomas J. Fratar, Alvin S. Goodman, and Austin E. Brant, Jr. (WW) Studies of observed berth occupancy patterns at commercial marine terminals have been made. Based on the close agreement between these observed patterns and theoretical frequency distribution functions, a method of predicting maximum berth occupancy has been developed.

2518. Navigation Model Studies of New Ohio River Locks, by Eugene P. Fortson, Jr., and George B. Fenwick. (WW) This paper describes the use of model studies in solving turbulence problems induced by the new high-lift locks of the modernized Ohio River navigation lock and dam system now under construction by the Corps of Engineers. Optimum locations and arrangements of structures are determined for safe passage of large tows.

2519. Stresses Around Rectangular Openings in a Plate, by H. Boyd Phillips and Ira E. Allen. (EM) Curves have been developed for determination of the normal stress around rectangular openings when subjected to uniaxial or

biaxial stress fields. Height to width ratios between 0.4 and 2.5 have been studied. The study was made experimentally, utilizing the photo-elastic interferometer method of stress analysis.

2520. Regla Steam Electric Station, by George T. Ingalls. (PO) This paper describes the design of a four unit steam electric station. Unusual features include design of foundation to cope with stiff clay and rock strata and slag deposits, outdoor-type construction, strengthening gantry crane, and ventilating louvers for turbo-generator housings.

2521. Flow Losses in the Lower Gila River, by Lawrence F. Pratt. (HY) This paper describes a method for estimating losses from infrequent flows in the lower reaches of the Gila River in Arizona. The same procedure can probably be applied to other intermittent streams if sufficient data are available.

2522. Fundamental Aspects of Thixotropy in Soils, by James K. Mitchell. (SM) Thixotropic phenomena are described, and a hypothesis for thixotropic behavior based on initial nonequilibrium of interparticle forces after remolding or compaction, and subsequent structure changes within the soil, are offered. Experimental results consistent with the hypothesis are presented. Some practical aspects of thixotropy are pointed out.

2523. Static Tension Tests of Compact Bolted Joints, by Robert T. Foreman and John L. Rumpf. (ST) Static tension tests of large butt joints, fabricated from A7 steel, fastened with A325 bolts, and arranged in compact patterns, indicate that present design specifications are unduly conservative with respect to the shear strength of the bolts.

2524. Capacitance Method of Measuring Water Film Thickness, by Robert H. Black. (HY) A water film thickness gauge was developed for making rapid measurements of the depth of a water sheet flowing on a plane surface. The gauge uses the electrical capacitance between a fixed metal plate and the water surface to sense the air gap and, by difference, measure the water depth.

2525. Sedimentation Aspects in Diversion at Old River, by Fred B. Toffaleti. (HY) This paper presents the sedimentation aspects of channel evolution leading to necessity of control. It is shown that the distributary system is in a state of imbalance in sediment transport capacity, the nature of which led to the conclusion that the flow capacity of the Atchafalaya River can be expected to increase annually.

2526. Drag and Lift on Spheres within Cylindrical Tubes, by Donald F. Young. (HY) A method for evaluating the lift and drag forces that are exerted by a moving fluid on a spherical particle resting on the bottom of a cylindrical tube is described.

2527. Drainage and Water Management Research in Western Europe, by William W. Donnan. (IR) An indication is made of the ease with which an American visitor can communicate

with the engineers of Western Europe. Brief descriptions of some of the work going on in the countries visited by the author are presented.

2528. Design of Welded Aluminum Structures, by H. N. Hill, J. W. Clark, and R. J. Brungraber. (ST) Design rules are proposed for welded aluminum structures. The proposed design methods are conservative, yet more realistic than previously used design procedures.

2529. Correlation of Vehicle Design and Highway Design, by Richard A. Haber and David K. Witheford. (HW) Past and present developments in the highway field indicate that insufficient coordination of vehicle design and highway design is placing the highway program in a precarious position. The situation calls for a unified research approach supported by industry and all interested groups and agencies.

2530. World Practices in Water Measurement at Turnouts, by Charles W. Thomas. (IR) Measuring devices at farm turnouts on open channel irrigation systems are discussed under six general functional classifications regarding the type of device best suited to meet local requirements are not drawn.

2531. Models Primarily Dependent on the Reynolds Number, by W. P. Simmons, Jr. (HY) The design, construction, and operation of models of closed-conduit fluid systems, and interpretation of test data are discussed. General rules for model size, construction, instrumentation, operating Reynolds number ranges, and data analysis are given.

2532. Discussion of Proceedings Paper 2197, 2199, 2220. (EM) John A. Blume on 2197. K. Yervant Terzian on 2199. John A. Blume, Edward Cohen, and Samuel Weissman on 2220.

2533. Discussion of Proceedings Paper 1800, 2145, 2275, 2277. (HW) L. D. Childs on 1800. George W. Ring on 2145. N. C. Raab, Burton H. Sexton, William R. McConochie, John C. Kohl, Harold M. Lewis, and William H. Claire on 2275. Gerald D. Love on 2277.

2534. Analysis of Load Distribution in the Piles of Piers, by M. A. Gouda. (WW) Simplified assumptions and pile displacements are used to develop the solution. Piers are divided into those having symmetrical and unsymmetrical groups of piles.

2535. Discussion of Proceedings Paper 2022, 2056, 2079, 2224, 2260, 2265, 2310, 2311, 2317, 2335. (HY) J. B. Bryce on 2022. Joseph E. Upson on 2056. Task Group of Hydrologic Data of the Committee on Hydrology on 2079. C. T. Advani on 2224. C. Blanchet, D. R. Dawdy and R. W. Carter, M. Gamal Mostafa, James K. Culbertson and Carl F. Nordin, Jr. on 2260. E. G. Kruse on 2265. John C. Stevens on 2310. Lucien M. Brush, Jr., Hau-Wong Ho, and E. J. Hall on 2311. Remig A. Papp on 2317. William G. Hoyt and E. Shaw Cole on 2335.

2536. Discussion of Proceedings Paper 1963, 1964, 2059, 2153, 2154, 2156, 2160, 2281,

2282, 2283. (IR) Harry F. Blaney on 1963. William W. Donnan on 1964. P. H. McGauhey and Harry Erlich on 2059. N. E. Minshall and D. A. Woolhiser on 2153. William W. Donnan, William F. Long, Herman Bouwer, Jan van Schilfgaarde, R. William Nelson, and John G. Sutton on 2154. W. C. Walton and J. W. Stewart on 2156. William W. Donnan on 2160. Max Suter on 2281. Robert O. Thomas on 2282. Raphael G. Kazmann, Frederick L. Hotes, and Paul Baumann on 2283.

2537. Discussion of Proceedings Paper 1671, 1735, 1739, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 2289, 2291, 2312, 2313. (PO) William G. Huber on 1671. G. F. Sudman on 1735. Addendum to Closure of 1739. Calvin V. Davis on 1741. James J. Growdon on 1742, 1743, 1744. No closure to 1745. J. Barry Cooke on 1746. Luis Henrique Gomes Fernandes, Edgard de Oliveira, and Nuno de Vasconcelos Porto on 1747. F. L. Lawton on 2289. Simon Peters on 2291. F. L. Lawton and William T. Walker on 2312. G. S. Sarkaria on 2313.

2538. Discussion of Proceedings Paper 1864, 2135, 2212, 2214, 2216, 2217, 2292, 2294, 2295, 2320, 2368. (SM) Jose A. Lahoz and Addendum to Closure of 1864. John A. Focht on 2135. G. H. Johnston, G. Robert Lange, Henry W. Stevens and William P. Verville on 2212. Harry R. Cedergren, F. P. Silva, O. H. Gilbert, Jr., and John L. McRae on 2216. Karl H. Evans on 2217. I. da Silveira, O. H. Evans on 2217. S. C. Schiff, Charles Szechy, B. A. Kantey, Yoshichika Nishida, A. A. Eremin, and W. I. Low on 2292. Miles D. Catton, D. J. MacLean and K. E. Clare on 2294. J. K. Sexton, Per Hall and D. F. Murphy on 2295. N. N. Ambraseys on 2320. R. K. Bernhard and D. F. Coates on 2368.

2539. Discussion of Proceedings Paper 2005, 2223, 2256, 2259, 2262, 2305, 2322, 2384. (ST) J. F. Baker on 2005. H. H. Bleich and M. G. Salvadori on 2223. Milik Tichy and Milos Vorlieck on 2256. Elwyn H. King on 2259. Edward Cohen and A. W. Coutris on 2262. Robert Dannemann on 2305. D. M. Brotton and G. D. Galletly on 2322. Ralph L. Barnett on 2384.

2540. Discussion of Proceedings Paper 2168, 2171, 2177, 2301, 2318. (WW) R. G. Dean and P. S. Eagleson on 2168. Omar J. Lillevang on 2171. P. S. Eagleson and R. G. Dean on 2177. J. R. Bowman on 2301. W. C. Q. Joosting on 2318.

JULY

Journals: Hydraulics, Sanitary Engineering, Structural, Surveying and Mapping.

2541. Limit Design of Reinforced Concrete Beams, by D. T. Wright and C. Berwanger. (ST) This paper presents

complete analyses of the inelastic behavior of a two-span continuous reinforced concrete beam, for both simple plastic and strain-hardening, moment-rotation relationships. The analyses predict rotation requirements that may be compared with limiting rotation capacities in design.

2542. Secondary Stresses in Parallel Wire Suspension Cables, by Thomas Alan Wyatt. (ST) The working stress in a parallel wire cable is normally based on the average stress across a section of the cable. This paper analyzes the variation of stress across the section, caused by deflection of the cable. Numerical examples show that secondary stresses may be an important part of the effects of live loading.

2543. Accident Preparedness in Reactor Waste Treatment, by E. D. Harward. (SA) Several technical approaches useful in developing emergency procedures in case of an accidental release of liquid radioactive waste from a nuclear reactor are suggested. Some of the difficulties encountered are presented.

2544. Various Instability Modes of the Fixed Base Column, by D. A. Sawyer. (ST) Equations are developed and comparisons made for the buckling loads of columns fixed at the base and loaded at the upper end by frictionless rollers, and by links of various construction. Discussion of the use of certain of these equations in the field of lift-slab construction is made.

2545. Dynamic Response of Elastoplastic Frames, by Joseph Penzien. (ST) This paper presents the results of an analytical investigation involving a single mass system that has an idealized elastoplastic resistance deformation relationship and that is subjected to the ground motion measured by the United States

Coast and Geodetic Survey during the May 1940 El Centro earthquake. All results are presented in the form of graphs.

2546. Drag Forces in Velocity Gradient Flow, by Frank D. Masch and Walter L. Moore. (HY) An exploratory investigation was made of the drag coefficient for a circular cylinder as influenced by a velocity gradient along its axis. Some of the three-dimensional aspects of the flow mechanics were described qualitatively. Experiments indicated that the local drag coefficient varied significantly along the length of the cylinder.

2547. Matrix Analysis of Plane Rigid Frames, by Fernando Venancio Filho. (ST) The problem of plane rigid frames is formulated in matrix form, using the principle of virtual work with displacements or forces as unknowns. The method is especially suitable for highspeed digital computers.

2548. Highway and Bridge Surveys: Analytic Geometry in Highway Design and Layout, Progress Report of the Committee on Engineering Surveys of the Surveying and Mapping Division. (SU) This paper explains methods of using line equations in the computations for highway design and layout based on plane coordinates, and demonstrates self-checking computations. Only basic mathematics are involved. It is believed that the use of the methods as demonstrated will avoid errors and save engineering time in design and layout.

2549. Man Versus Environment, Twenty-Seventh Research Report of the Committee on Sanitary Engineering Research of the Sanitary Engineering Division. (SA) Man's relation to his environment is changing rapidly, especially in terms of the complex problems of environmental engineering resulting from new developments in science and technology. The conference reported here was designed to focus attention on the status of these

problems in the major fields of water supply, water pollution, air pollution, food technology, and occupational health.

2550. Surveys at Cougar Reservoir, by Charles N. Oros. (SU) An outline is given of surveys made in the Willamette Valley preliminary to the special surveys at Cougar Reservoir and Dam Site. Factors which must be considered in large scale photogrammetric mapping of precipitous high relief areas are presented.

2551. Unsteady Flow of Ground Water into a Surface Reservoir, by William Hauschild and Gordon Kruse. (HY) Prediction of the water table position and the amount of water discharged where ground water is flowing from an aquifer to a surface reservoir has not been exact. The nonlinear partial differential equation that describes the shape of the water table is difficult to solve. Approximate solutions obtained by two different methods of the nonlinear equation are presented.

2552. Method for Analysis of Multi-beam Bridges, by John E. Duberg, Narbey Khachaturian, and Raul T. Fradinger. (ST) A general method for the analysis of multibeam bridges is presented. Expressions for moment, shear, and torque in each beam element due to a concentrated load acting at any point on the multibeam bridge are derived. The method developed is applied in calculating the vertical moments in beam elements of a solid square section constituting a multibeam bridge.

2553. SDR Survey for Proposed Chesapeake Bay Crossing, by Walter C. Beckmann, Charles L. Drake, and George H. Sutton. (SU) The application of a wide band, spark source echo sounder, the Sub-Bottom Depth Recorder (SDR), to foundation studies for the proposed Chesapeake Bay Highway Crossing from Little Creek to Cape Charles, Va., is described in detail. Reflection horizons are correlated with varying properties of the sediments as revealed in test borings.

2554. Automatic System for Monitoring Water Quality, Twenty-Eighth Progress Report of the Committee on Sanitary Engineering Research of the Sanitary Engineering Division. (SA) Personnel of the Lehigh Water Resources Research Council, under contract to the Interstate Commission on the Delaware River Basin, have developed a fully automatic sampling facility for parameters which are indicative of water quality.

2555. Basic Column Strength, by Lynn S. Beedle and Lambert Tall. (ST) A summary is presented of a theoretical and experimental investigation of the strength of centrally loaded columns as influenced by residual stresses and variations in the yield-stress level. It is shown that the basic strength of structural steel columns containing residual stresses may be expressed in terms of the tangent modulus. Approximations suitable for design use are suggested.

2556. Solubility of Atmospheric Oxygen in Water, Twenty-Ninth Progress Report of the Committee on Sanitary Engineering Research of the Sanitary Engineering Division. (SA) For many years, the saturation concentrations of gaseous oxygen dissolved in distilled water have been accepted as correct. Recently a group of researchers in England conducted experiments that showed significant differences from the previously accepted saturation concentrations. The research conducted herein was to determine true saturation values throughout the normal range of natural stream water temperatures.

2557. Sedimentation in Reservoirs in the Southeast, by John E. Jenkins, Charles E. Moak, and Daniel A. Okun. (SA) The most recent reservoir sediment data have been analyzed in this report to evaluate factors that can be used to predict sedimentation in reservoirs in the southeastern United States.

2558. Light Conversion Efficiency of Algae Grown in Sewage, by William J.

Oswald. (SA) Engineering design of cultures of algae for effective waste treatment or reclamation is dependent on the algal light conversion efficiency, which is highly variable and strongly influenced by the environment. This paper presents results of studies of light conversion by sewage-grown algae as a function of physiochemical environment.

2559. Lateral Buckling of Beams, by J. W. Clark and H. N. Hill. (ST) This paper is intended to provide a brief summary of information that may be used as background material in writing specifications for the design of beams and girders whose strength is controlled by lateral buckling. Various design formulas that have been proposed for beams are compared with each other and with experimental and theoretical beam strengths.

2560. Discussion of Proceedings Paper 2166, 2365, 2379. (SU) Michael V. Smirnoff, William M. Spann, Albert A. Stanley, and Robert C. Sheldon on 2166. T. F. Hickerson on 2365. Francis Bates on 2379.

2561. Discussion of Proceedings Paper 2343, 2407, 2554. (SA) Harris F. Seidel on 2343. K. J. Ives on 2407. C. H. J. Hull on 2554.

2562. Discussion of Proceedings Paper 2260, 2311, 2335, 2339, 2340, 2429. (HY) R. J. Garde and John L. Bogardi on 2260. Charles G. Gunnerson on 2311. Murray Blanchard, Arthur H. Frazier, and J. C. Stevens on 2335. Paul C. Constant, Jr., Marcel Bitoun, Claud C. Lomax, Joseph W. Maier and Thomas C. Miller, and J. M. Robertson on 2339. Gerald Lacey and N. Rajaratnam on 2340. Henry J. Tebow on 2429.

2563. Discussion of Proceedings Paper 1708, 2346, 2350, 2384, 2450. (ST) Robert H. Sherlock on 1708. A. A. Eremin on 2346 and 2350. Lester H. Gabriel on 2384. Richard H. J. Pian on 2450.

AUGUST

Journals: Engineering Mechanics, Hydraulics, Power, Soil Mechanics and Foundations, Structural.

2564. Foundation Vibrations, by F. E. Richart, Jr. (SM) Theoretical solutions for the vibrations of foundations resting on soil have been studied and evaluated. For vertical vibrations, the theory for oscillators resting on an elastic semi-infinite body is usually required because of the effects introduced by the motion of the soil. Examples are given.

2565. Stresses in Layered Elastic Solids, by M. M. Lemcoe. (EM) General equations for stress are derived for multi-layer systems that satisfy conditions of plane strain. These equations may be used to calculate stresses in the supporting layered media for embankments, continuous footings, canals, etc., if the supporting media can be approximately represented as a two-layer plane strain system. The three and four layer cases may be solved with little additional difficulty with the aid of a digital computer.

2566. Reinforced Concrete Shear Wall Assemblies, by Jack R. Benjamin and Harry A. Williams. (ST) This paper gives the results of an investigation of one-story and two-story reinforced concrete shear wall assemblies. Eight models were tested. Theoretical and experimental results are compared.

2567. Lateral Stability of Frames by Energy Method, by Donald E. Johnson. (EM) A method of analyzing the elastic stability of rigid frame structures subject to sidesway is presented. Formulas describing the energies involved are given and presented in graph form. Two examples are given and compared to results obtained by more rigorous methods.

2568. Digital Computers for Trial-Load Analysis of Arch Dams, by L. R. Scrivner. (PO) Stress analysis of concrete dams is another engineering problem that can be expedited by the use of electronic

computers. The use of the trial-load method has been restricted, because the programming of many of these operations for an electronic computer results in a saving of time and costs.

2569. Design of Arch Dams by Trial-Load Method of Analysis, by Merlin D. Copen. (PO) A brief resume of the basic principles involved in the trial-load method of stress analysis is presented. The various types of analyses, and their advantages and limitations, are examined. The application of trial-load methods to design problems and practical examples resulting from these procedures are illustrated and described in detail. It is also shown that the use of stress analysis is economical.

2570. Flood Distribution Problems Below Old River, by Frederic M. Chatry. (HY) Assuring the safe passage of flood flows on the Mississippi River at and below Old River requires that a controlled system of natural streams and artificial floodways be operated to distribute peak flows in accordance with the design capacities of the various system segments. The factors influencing the operation are examined.

2571. Seepage Losses from Parallel Canal Systems, by H. Y. Hammad. (EM) This paper deals with the two-dimensional problem of steady seepage flow under gravity from a system of parallel, identical, and equally spaced canals into a semi-pervious clay layer of finite thickness underlain by a freely permeable layer of sand and gravel in which the piezometric head is very near the canal water level.

2572. Vibrations of Structural Systems by Component Mode Synthesis, by Walter C. Hurty. (EM) Natural modes and frequencies of structural systems are determined by an energy method using mode functions, applicable to the complete system or subsystem, which are synthesized from admissible mode functions selected for the component members of

the system. The synthesis is accomplished by using equations of constraint.

2573. Irrotational Motion of Two Fluid Strata Towards a Line Sink, by D. G. Huber. (EM) The flow of two fluids of different density toward a line sink located in the bottom corner of a rectangular configuration, with the upstream end extending to infinity, was studied by relaxation techniques. Relationships between the Froude numbers in the two layers were determined and the critical condition, when the lighter fluid begins or ceases to flow, was estimated.

2574. Pile-Driving Analysis by the Wave Equation, by E. A. L. Smith. (SM) There are a great many different pile-driving formulas in use, and engineers have never been able to agree as to which one is best. This paper gives engineers a mathematical method of wider application, depending on the use of electronic computers and numerical integration. The method is also applicable to other impact problems.

2575. Underground Structures Subject to Air Overpressure, by Ernest T. Selig, Keith E. McKee, and Eben Vey. (EM) An analytical procedure is presented for determining the damage to underground structures induced by pseudo-steady state air overpressure. By introducing appropriate assumptions from the fields of soil mechanics and structural dynamics, it is possible to derive analytical expressions that relate the parameters of the structure, the soil, and the loading as they affect the failure of the structure.

2576. Geometry of Moiré Fringes in Strain Analysis, by Stanley Morse, August J. Durelli, and Cesar A. Sciammarella. (EM) This paper shows how moiré fringes can be used in the two-dimensional analysis of strains. The fundamental equations of the moiré method are derived and are presented in the form of graphs by means of which strains and rotations can be obtained from simple measurements with a minimum of computation.

2577. Predicting Storm Runoff on Small Experimental Watersheds, by Neal E. Minshall. (HY) A method is presented for extending the period of runoff records based on analysis of existing short-term records of rainfall and runoff for a watershed, and a longer record of rainfall. A method for developing synthetic unit hydrographs for ungaged areas is also presented.

2578. Arch Dam Analysis with an Electric Analog Computer, by Richard H. MacNeal. (EM) An electric analogy that simulates the elastic deformations of arch dams is described. This analogy consists of resistors, transformers, and current generators. The results of an analog computer analysis of the Stevenson Creek Dam are compared with field measurements. The results of a design study of the Blue Ridge Dam are summarized.

2579. Design of Karadj Hydroelectric Project, by Richard D. Harza and Robert F. Edbrooke. (PO) This paper describes the development and design of a large water supply and hydroelectric project near Tehran, Iran. Also described are the high, double-curvature, thin-concrete arch dam; the extensive model-testing program; the reliable source of the municipal water supply; and the operation for peaking power with reregulating dam and pool.

2580. Elastic Model Design of the B-58 Airplane, by J. W. Wells and H. B. England. (EM) This paper outlines the extensive elastic model test program used in the design of a highly redundant structure on the B-58 airplane. Considerations in the design of the various models on the program are listed and several unique methods of obtaining and presenting test data are shown. Scale factors for both structure and loadings are developed in detail in the Appendix.

2581. Strength of Welded Aluminum Columns, by R. J. Brungraber and J. W. Clark. (ST) Welding heat-treated or cold-worked aluminum alloys causes partial annealing of the material in the vicinity of the welds, so that the strength of the

material near the welds is lower than the strength of the material in the rest of the structure. An experimental and analytical investigation was conducted to determine the effect of the varying mechanical properties on column strength.

2582. Some Basic Concepts in Matrix Structural Analysis, by Frank R. Berman.

(ST) The development of the electronic digital computer and the application of matrix algebra has made it possible for the structural engineer to analyze complex or highly redundant structures. Recently, papers have utilized the "flexibility" or "stiffness" matrix approach. This paper points out the common origin of these methods in energy and investigates procedures for calculating the total energy of a structure. The concept of the "total" structure will be considered. Applications include analysis of a truss with elastic supports and a continuous beam.

2583. Discussion of Proceedings Paper 2096, 2332, 2434, 2439. (EM) A. Hrennikoff on 2096. J. A. Veltrop on 2332. D. E. Hudson, G. W. Housner, and T. K. Caughey on 2434. George Pincus and George Winter on 2439.

2584. Discussion of Proceedings Paper 2130. (PO) Charles L. Townsend on 2130.

2585. Discussion of Proceedings Paper 2094, 2344, 2346, 2384, 2437, 2446, 2461. (ST) Nathan M. Newmark on 2094. Ming L. Pei on 2344. Valerian Leontovich on 2346. Henry J. Cowan and Oliver G. Julian on 2384. Clarence J. Derrick and G. W. Housner on 2437. Richard J. Newson on 2446. George B. Begg, Jr. on 2461.

2586. Discussion of Proceedings Paper 2216, 2294, 2295, 2319, 2368, 2431, 2453. (SM) R. E. Olson and J. D. Scott on 2216. Ernest Zube and Earl J. Felt on 2294. Frederick E. Crory on 2295. K. A.

Linell on 2319. A. A. Eremin on 2368. D. F. Coates on 2431. Hashim H. Hamzawi on 2453.

2587. Discussion of Proceedings Paper 1997, 2058, 2084, 2339, 2340, 2362, 2369, 2374, 2469, 2478. (HY) S. V. Chitale, K. Arunachalam, F. Paderi, Joe M. Lara, and Kenneth B. Schroeder on 1997. Edwin W. Eden, Jr. on 2058. Ven Te Chow on 2084. G. C. Anderson, J. V. Radziul, and P. Celenza on 2339. Donald VanSickle on 2340. J. L. Kovner on 2362. Joseph N. Bradley on 2369. Herman G. Heinemann on 2374. Ven Te Chow on 2469. C. D. Smith on 2478.

SEPTEMBER

Journals: Highways, Irrigation and Drainage, Sanitary Engineering, Structural, Waterways and Harbors.

2588. Development of Rotational Irrigation in Taiwan, by Lee Chow. (IR) Rotational irrigation, now rapidly replacing the old irrigation practice in Taiwan, is described with special emphasis on design and operation of such irrigation systems. Future improvements to be made and possible research to be done are also pointed out.

2589. Geophysical Procedures in Ground Water Study, by H. R. McDonald and Dart Wantland. (IR) Although geophysical methods of subsurface exploration were developed primarily for, and have been used most extensively by, the petroleum industry, many of the procedures apply equally well in the search for ground water. The principles of the geophysical methods most useful in ground water exploration are described and illustrated.

2590. Tetrapods and other Precast Blocks for Breakwaters, by P. Danel, E. Chapus, and R. Dhaille. (WW) Other shapes have been proposed for precast blocks for breakwaters since tetrapods

were first introduced about 10 yr ago. The authors briefly consider the problems arising in the design, manufacture, and placing of such blocks. Consideration is then given to the problem of utilizing precast blocks on breakwaters. Attention is drawn to the great number of factors that have to be taken into account when designing a breakwater.

2591. Installation of Drain Tile for Subsurface Drainage, by John G. Sutton. (IR) This paper reports current progress in installation of tile drains for subsurface drainage. It also describes benefits of tile drainage, discusses tile used in combination with surface drainage, and describes current procedures used by the Soil Conservation Service in making drainage investigations. Recommendations are given for use of concrete tile under acid and alkali conditions.

2592. High Temperature Effects on Bituminous Mixes, by William H. Gotski. (HW) Temperature effects on the stability characteristics of bituminous mixtures were studied for four asphalt and aggregate temperatures. This study was made to ascertain the temperature at which detrimental characteristics are exhibited. Analysis of variance techniques were used to evaluate the basic factors affecting the test results.

2593. Irrigation and Drainage Potentials in Humid Areas, by Marion Clifford Boyer. (IR) In the words of the demographers, the world's population is "exploding." It is estimated that by the year 2,000, the United States will be producing approximately one-third more food than needed for its own people, while Communist China and much of the rest of the world will be producing less than one-half the food needed. Civil engineers must accept the responsibility for making the cultivated lands yield most efficiently through proper irrigation and drainage, particularly in the humid areas of the world.

2594. Drawdown due to Pumping from an Unconfined Aquifer, by Robert

E. Glover and Morton W. Bittinger. (IR) Based upon the Dupuit-Forschheimer idealization, a first approximation to the drawdown y at the radius r in an unconfined aquifer of permeability K , saturated depth D , and drainable voids V due to pumping at a constant rate Q for the time t is obtained. A second approximation accounting for the effect of drawdown is found. The flow conditions are specified by a parameter.

2595. Methods of Applying Irrigation Water, by Paul H. Berg. (IR) The factors influencing the selection of a method of applying irrigation water on a farm are described in general. The various methods of irrigation and a brief examination of the conveyance and distribution systems used for providing irrigation water on an individual farm are presented.

2596. Freeway Spacing in an Urban Freeway System, by James M. Peterson. (HW) The various controls that influence freeway spacing in an urban freeway system are described and categorized. A simplified study procedure is outlined that illustrates the interrelationships of certain variables affecting freeway spacing in a grid system.

2597. Arkansas River Plan, by William Whipple, Jr. (WW) Development of the Arkansas River for navigation and other purposes poses especially difficult problems on account of the quantity of sediment carried. A revised concept and plan based on relationships between slopes, depths, and widths of contracted channels results in the elimination of three dams and savings of \$31,000,000.

2598. Computer Application in Groundwater Hydrology, by Joseph Foley. (IR) The Theis equation is adapted for computer solution of four types of problems inherent in many industrial well-water developments: (1) Drawdown calculations; (2) Aquifer constants "T" and "S"; (3) Well spacing; and (4) Capacity of a well system. Objectives, equations, computation se-

quence, print-out of results, and computer time are outlined for each problem.

2599. Shark River Inlet Sand By-Passing Project, by W. Mack Angas. (WW) This paper describes the by-passing of sand across an Atlantic Coast bay inlet in a successful effort to correct an unwanted accretion and erosion problem resulting from littoral drift. This is one of the first major by-passing projects to be accomplished by mechanical rather than by hydraulic methods.

2600. Pneumatic Barrier Against Salt Water Intrusion, by Ian Larsen. (WW) In rivers subject to salt water intrusion, bubbles of air from perforated pipes on the river bottom will create an upward flow of salt water and thus, a mixing between the fresh and salt water layers. When the upward flow reaches the absolute maximum of salt water discharge, the salt water will be unable to penetrate the bubble "curtain." Such installations may provide the answer to the salt water problem in many rivers.

2601. Studies of a Channel through Padre Island, Texas, by E. A. Hansen. (WW) The problems of tidal hydraulics encountered in design of an artificial inlet from a gulf to an almost tideless bay are numerous. This paper presents the results of several years' observation of tide and current phenomena in such an inlet, and the studies made to determine the best design for a jettied navigation channel through the inlet.

2602. Plan for Closure of Old River, by George M. Cookson. (WW) The closure of Old River is the crucial feature of the project for flood control and improvement of the lower Mississippi River. This operation involves an initial rock closure, followed by a final hydraulic fill. Geological features and hydraulic characteristics require this procedure in order to provide maximum assurance of positive closure within economical limitations.

2603. Design of Inlets for Texas Coastal Fisheries, by H. P. Carothers

and Homer C. Innis. (WW) The basic formulations for dynamic balance in design of Texas coastal inlets to permit fish passage through the littoral barriers and induce Gulf water interchange for control of bay salinities are presented. Rollover and Yarbrough passes illustrate extremes of erosion and siltation. Cedar Bayou illustrates elastic limit design toward siltation.

2604. Traffic Behavior and Freeway Ramp Design, by Charles Pinnell and Charles J. Keese. (HW) Highway designers must become more concerned with the relationship of design and traffic behavior in order to obtain maximum operational efficiency on freeway facilities. This paper points out the operational characteristics of freeway ramp traffic and presents requirements for correlating ramp design with traffic behavior.

2605. Use of Algae in Removing Phosphorus from Sewage, by R. H. Bogan, O. E. Albertson, and J. C. Pluntze. (SA) The concept of employing algae as a means of removing phosphorus from domestic sewage was investigated in the laboratory. Work leading to development of a tertiary stage photosynthetic treatment process is described. Laboratory and field scale pilot plant studies are reported on.

2606. Southwest Pass—Mississippi River 40-ft Channel, by Austin B. Smith. (WW) The paper examines shoaling triggered by a saltwater wedge, maintenance and channel improvements for the 35-ft ship channel, field data obtained, saltwater intrusion phenomena, shoaling rates, and prototype studies. Conclusions are based on empirical findings and model tests.

2607. Low Pressure Aeration of Water and Sewage, by N. Claes H. Fischerstrom. (SA) Based on simplified theoretical considerations, a calculable system utilizing dispersed air at shallow depths has been developed. Elaborate tests and full scale operations have proved that it is possible to obtain an

extremely high-oxygenation capacity with this principle, and with perforated pipes as air distributors. Clogging of the pipes has been studied and satisfactorily eliminated.

2608. Tests on a 120-ft-Span Prestressed Concrete Beam, by G. D. Base and R. E. Rowe. (ST) Tests to destruction have been carried out on a 120-ft-span prestressed concrete beam similar to the beams to be used in the construction of a 4-span overpass at the Chiswick rotary junction. The tests showed that the design assumptions with regard to the loss of stress due to friction and short-term creep, shrinkage, and relaxation were valid. The behavior of the beam in the working-load range agreed excellently with the behavior predicted.

2609. Discussion of Proceedings Paper 2089, 2343, 2408, 2411, 2424. (SA) Norman B. Hume, Robert D. Bargman, Charles G. Gunnerson, and Charles E. Imel on 2089. John A. Logan on 2343. M. B. McPherson on 2408. F. Sulzer and C. E. Keefer on 2411. J. M. Jordan, Jr. and C. H. Lawrance on 2424.

2610. Irrigation in Latin America, by Lyman S. Willardson. (IR) Irrigation agriculture in three representative Latin American countries needs competent technological guidance to utilize the potential of unusual tropical conditions. Non-uniform annual distribution of rainfall combined with ideal soil and twelve-month growing season favor high agricultural development in these representative Latin American countries through supplemental irrigation, coupled with co-existent drainage of excess rainfall during wet seasons.

2611. Discussion of Proceedings Paper 2171, 2422, 2423. (WW) Thorndike Saville, Jr. and Robert Y. Hudson on 2171. F. F. Escoffier on 2422. J. W. Dunham, Per Bruun, and J. M. Jordan, Jr. on 2423.

2612. Discussion of Proceedings Paper 2410, 2428, 2496. (ST) Merlin D. Copen

on 2410. William A. Boe on 2428. W. Jurkovich on 2496.

2613. Discussion of Proceedings Paper 2154. (IR) A. R. Robinson on 2154.

2614. Discussion of Proceedings Paper 2275. (HW) Henry A. Barnes, John Rannels, Charles M. Noble, Hawley S. Simpson, Virdin A. Rittgers, and Seymour Kashin on 2275.

OCTOBER

Journals: Engineering Mechanics, Power, Soil Mechanics and Foundations, Structural.

2615. Restrained Columns, by Morris Ojalvo. (EM) A method determining the carrying capacity of restrained columns of constant cross section is described. The column failure considered is due to bending about a principal axis of the cross section. The plane of bending is the plane of thrust, applied moments, and restraining moments. The method is applicable when the loads are applied to columns with equal or unequal and eccentricities and cases in which the restraining moments are not linear functions of the end rotations of the columns.

2616. Wind Stresses in Dome, by P. Gondikas and M. G. Salvadori. (EM) Bending stresses due to anti-symmetrical wind pressures in a hemispherical dome elastically built-in into a cylinder are determined by the Geckeler approach extended to non-symmetrical loads. A numerical comparison with the asymptotic solution of Schwerin indicates satisfactory accuracy of this approximate solution in cases of practical interest.

2617. A Matrix Formulation of the Folded Plate Equations, by A. C. Scordelis. (ST) An analytical procedure, utilizing matrix algebra, is developed for determining longitudinal stresses, transverse moments, and vertical deflections in folded plate structures. The sequence

of matrix operations can be programmed for a digital computer having available matrix subroutines. A sequence which has been programmed for the IBM 704 computer is described.

2618. Experience with a Pier-Supported Building over Permafrost, by H. B. Dickens and D. M. Gray. (SM) The construction and performance of a two-story steel frame building over permafrost at Churchill, Manitoba, for 1948 to 1950, is described. Its performance after 9 yr suggests that the concrete pier and spread footing foundation used is a practicable alternative to embedded foundations for large heated structures in permafrost regions.

2619. Bending of Plates on a Viscoelastic Foundation, by K. S. Pister and M. L. Williams. (EM) E. Reissner extended the concept of the classical Winkler-Zimmerman foundation to permit introduction of a differential shear stiffness parameter to the foundation modulus. The resulting system of differential equations of the sixth order is modified, incorporating a different interface condition. The significance of the shear stiffness parameter is examined.

2620. Electrical Energy Analogs of Vibrating Beams, by Frederick L. Ryder. (EM) For the passive-element electrical analog of a finite increment of a beam vibrating in flexure, improvements over the conventional form of the circuit are found by making explicit use of the energy as an analogous parameter in the beams and in the electrical circuit. For a given beam, it is found that these improvements lead to a drastic reduction in the theoretical analog error and in the number of electrical components required per beam increment.

2621. Test of a Riveted Plate Girder with a Thin Web, by D. D. Vasarhelyi, J. C. Taylor, N. C. Vasishth, and C. Y. Yuan. (ST) This paper reports on the buckling and post-buckling behavior of the web and the functioning of flanges at

the cover plate cutoffs of a riveted plate girder with a web thinner than specified by AASHTO. Results show that buckling of the web does not impair load-carrying capacity.

2622. Elastic Plastic Analysis of Transversely Loaded Plates, by John F. Brothie. (EM) An elastic, purely-plastic relationship between moment and curvature is assumed; general solutions are developed from small deflection theory for axi-symmetrical yielding over an area and axi-symmetrical yielding along lines. Applications include the inelastic analysis of metal plates, pavement slabs, and continuous plate structures.

2623. Seepage Requirements of Filters and Pervious Bases, by Harry R. Cedergren. (SM) The water-removing capacities of two common but distinctly different types of filter designs are analyzed by the flow-net. Typical solutions and numerical examples emphasize the importance of boundary conditions and permeability upon water-removing capacity.

2624. Dynamic Response of Beams Traversed by Two-Axle Loads, by Robert K. Wen. (EM) The response of beams traversed by two-axle loads is analyzed assuming that the dynamic deflection is proportional to the static deflection from the weights of the beams and loads. Numerical results show quasi-resonant effects due to successive applications of loads and wavy beam surfaces.

2625. Mechanics of the Triaxial Test for Soils, by R. M. Haythornthwaite. (SM) The triaxial test analyzed against the background of plastic theory shows the equilibrium conditions and failure criterion as Coulomb's law insufficient to define a unique failure load; a stress-strain relationship is also needed. The problem is solved for an ideally plastic material. Results propose the significance of test data for sands; an alternative yield criterion is suggested on the basis of the test data.

2626. Generalized Solutions for Laterally Loaded Piles, by Hudson Matlock and Lymon C. Reese. (SM) To reach rational solutions for problems of laterally loaded piles, the non-linear force-deformation characteristics of the soil must be considered with repeated application of elastic theory. Soil modulus constants are adjusted for successive trials until satisfactory compatibility is obtained in the structure-pile-soil system. Basic equations and methods of computation are given for both elastic-pile-theory and rigid-pile theory. Several forms of soil modulus variation with depth are considered. Typical solutions are presented with recommendations for their use in design problems.

2627. The Bearing Capacity of Floating Ice Sheets, by G. G. Myerhof. (EM) The collapse of floating ice sheets under load is estimated on the basis of a rigid-plastic plate on an elastic foundation for various loading and boundary conditions. The results are compared with field observations in the operation of ice roads, floating airfields, and some small-scale loading tests.

2628. Membrane Stresses in Hyperboloid Shells of Revolution, by Placido Cicala. (EM) The computation of membrane stresses and corresponding deformations for a hyperboloid shell of revolution under the most general loading is reduced to the evaluation of simple integrals. For determining wind effects, diagrams capable of simplifying computations are presented, and an approximate formula is suggested.

2629. Buckling of One-Storey Frames and Buildings, by John E. Goldberg. (ST) The theory of buckling of plane, one-storey is described and applied to the collapse of rectilinear frames using a generalization of the slope-deflection method. Both the symmetrical and anti-symmetrical or lurching modes of collapse of plane frames are considered. The relation of the buckling of plane frames to the buckling of the complete structure is

pointed out, and a theory for the buckling of such space structures is presented. Illustrative examples are included.

2630. Long Span Prestressed Concrete Folded Plate Roofs, by John C. Brough, Jr. and B. H. Stephens, Jr. (ST) The economics of the design and construction of long span prestressed concrete folded plate structures is indicated by including actual construction costs of four roof structures. A simplified design procedure is outlined and a typical case presented. Field experience with construction methods utilized and recommendations for field inspection included are based on the author's observations.

2631. Discussion of Proceedings Paper 1734, 1739, 1743, 1745, 1749. (PO) J. B. Cooke and Torald Mundal on 1734. G. Robert Koch on 1739. John Lowe, III and James P. Growdon on 1743. Allen S. Carey on 1745. Paul Thurber on 1749.

2632. Discussion of Proceedings Paper 2220, 2445, 2453, 2454, 2498. (EM) George W. Housner on 2220. Morris Ojalvo and Ahmet Cakmak on 2445. Hashim H. Hamzawi on 2453. R. J. P. Garden on 2454. O. C. Zienkiewicz on 2498.

2633. Freezing and Thawing Effects on Prestressed Concrete, by M. J. Gutzwiller and F. E. Musleh. (ST) Freeze and thaw tests were conducted on 48 specimens representing strength levels of 5,000 psi and 3,000 psi. Some beams of 5,000 psi strength were post-tensioned throughout the test. Significant improvement in durability resulted from post-tensioning. Post-tensioned concrete specimens of a rich mix showed better durability than unstressed concrete of the same mix or of a leaner mix.

2634. Flow Graphs in Structural Analysis, by Kurt H. Gerstle. (ST) The relation of flow graphs to the analysis of physical systems is presented. The algebra and two methods of solution of these graphs are treated. The setting up

and solution of flow graphs is illustrated in terms of several problems from the field of indeterminate structural analysis.

2635. Discussion of Proceedings Paper 1879, 2410, 2428, 2437, 2480, 2544, 2555. (ST) Lawrence P. Johnson, Jr. and Herbert A. Sawyer, Jr. on 1879. K. G. Harding and N. S. Trahair on 2410. Francis E. Swain on 2428. A. A. Eremin on 2437. Eugene Guillard on 2480. Marvin A. Larsen on 2544. Donovan H. Lee on 2555.

2636. Discussion of Proceedings Paper 514, 1937, 2135, 2136, 2211, 2212, 2213, 2292, 2368, 2431, 2501. (SM) D. K. Bleifuss and James P. Hawke on 514. Ivan C. MacFarlane on 1937. B. K. Hough on 2135. W. J. Turnbull and C. I. Mansur on 2136. James F. Shook on 2211. James R. Cass, Jr. on 2212. C. Y. Li on 2213. G. G. Meyerhof on 2292. O. M. Christof Ehrler on 2368. B. K. Hough and A. A. Eremin on 2431. Bobby Ott Hardin on 2501.

NOVEMBER

Journals: Structural, Construction, Hydraulics, Sanitary Engineering, Waterways and Harbors.

2637. Use of Continuity-Factor and Final Position, by Yon-Sun Chou. (ST) The purpose of this paper is to introduce the use of continuity-factor and final position in the analysis of any continuous structures of simultaneous, one-direction, sway-movement, especially as applied to multi-bay, multi-story rigid frames. Such a structure or frame will be analyzed by the method of computing unbalanced moments, for which purpose a simple, clear procedure of analysis is obtained from the previously mentioned factor. A few examples are also presented.

2638. Corrected Deflection Theory of Suspension Bridges, by John Szidarovsky. (ST) This paper presents a deflection theory of a stiffened suspension

bridge that considers several effects neglected in previous theories, such as those due to shear force and to elongation of the cable. Only the theory, and not a practical method of solution, is dealt with.

2639. Soil Freezing to Reconstruct a Railway Tunnel, by George J. Low. (CO) Allowing for track rearrangements in a railway tunnel in Montreal, Canada, called for considerable ingenuity on the part of the contractors. The job was made especially difficult by the maze of underground facilities and the fact that the work had to be performed under the street between the two buildings. The subsurface conditions were such that the freezing of the soil was resorted to. The problems attendant to such a construction procedure are outlined.

2640. Research on Fire Resistance of Prestressed Concrete, by Hubert Woods. (ST) The need for research on fire endurance of concrete structural members is pointed out, and new facilities for such research are described. Some problems awaiting solution are treated, and difficulties in reaching analytical solutions are mentioned. Questions regarding present standard fire-testing techniques are also treated.

2641. Activated Carbon Removal of Hydrogen Sulphide, by R. S. Murphy and I. W. Santry. (SA) The removal of hydrogen sulphide from an air gas mixture presents many problems. This paper deals with the removal by one media only (activated carbon), but considers the many types of conditions that could occur, as well as the basic conditions that are created during the dynamic chemisorption.

2642. Bank Protection on Central Valley Streams, by H. W. Barsdale. (WW) Bank protection is an important adjunct to flood control and navigation projects in the central valley of California. The corrective measures that have generally proven satisfactory for the various types of channels varying from the tidal waters to the foothill streams are described.

2643. Principles of Virtual Work in Structural Analysis, by Frank L. DiMaggio. (ST) The principle of virtual work is derived for plane structures composed of straight members to permit a general interpretation of the function usually called "virtual displacement" and is applied to the determination of deflection in elastoplastic structures, and to the problems of deriving equilibrium equations.

2644. Flood-Frequency Relationships in the Pacific Northwest, by G. L. Bodhaine. (HY) This paper describes, in general terms, a method of determining the magnitude and frequency of expected floods that is applicable to any area in the Pacific Northwest of the United States. The development of a composite frequency curve applicable to any site in a large homogeneous region is examined, and the effect of mean elevation and size of drainage area on the shape of the frequency curves in designated parts of the Pacific Northwest is demonstrated.

2645. Load Distribution in Composite Girder-Slab Systems, by G. Hondros and J. G. Marsh. (ST) A series of simply-supported composite girder-slab systems embracing five and ten girders interconnected by a reinforced concrete slab was tested, from which confirmation of certain assumptions made in the design of a prototype bridge was sought. Comparisons between actual and theoretical behavior are made and the effect of skew angle of the bridge and torsional stiffness of the girders are assessed.

2646. Periodical Gravity Wave on a Discontinuity, by Bernard Le Méhauté. (HY) A general theory is presented to study the transmission and reflections of gravity waves on a discontinuity to the first order of approximation. Particular attention is given to cases of an obstruction, a change of width, and a change of depth. In the latter case only, the gravity wave arriving at an angle is studied.

2647. Russian River Channel Works, by Israel H. Steinberg. (WW) The paper presents evaluations of channel stabilization works constructed in 1956, by

the U.S. Army Corps of Engineers, San Francisco District, along a 4 mile test reach of Russian River, California. From observations of this work, tentative conclusions are reached that the works performed as planned and could be adapted to other reaches of Russian River.

2648. Hydrology and Flood Control Features at Oroville Dam, by Joseph I. Burns, Kenneth B. Mayo, and William A. Arvola. (WW) Oroville Dam, a 735 ft-high, zoned earthfill dam, is proposed for construction by the State of California on the Feather River, a major tributary of the Sacramento River. A summary of the hydrologic and meteorologic characteristics of the Feather River Basin and the hydrologic studies pertaining to the design floods for the project are presented. The preliminary spillway design concepts and proposed operating criteria are also discussed.

2649. Sacramento River Deep Water Ship Channel, by Amallo Gomez. (WW) This paper describes the functional planning studies made for the Sacramento River Deep Water Ship Channel, now under construction by the Corps of Engineers. This paper includes a description of the project, functional requirements, hydraulic studies, estimates of benefits, and comparison of benefits of costs.

2650. Shear Diaphragms of Light Gage Steel, by Arthur H. Nilson. (ST) It is recognized that the diaphragm strength of floor and roof elements of buildings can be utilized to resist horizontally-applied loads, eliminating the need for separate bracing systems. With proper attention to welding details, floors and roofs of light gage steel panels, designed primarily to carry vertical loads, will be effective as shear diaphragm. Extensive full-scale tests of light gage steel diaphragms are described and test results are interpreted.

2651. Statistical and Economic Analysis of a Bidding Trend, by Marvin Gates. (CO) Almost four hundred results of bids for heavy construction contracts are analyzed for correlation between the size

of the contract and the difference between the low and second bids. The results of this analysis are applied to four diversified areas of competitive bidding. They are that: another criteria for ascertaining the probable existence of a gross mistake in a bid is offered; a suggested maximum amount of bid guarantee is treated; the practice of using "going" prices is investigated, and three methods for increasing profits, based on probability factors, are described.

2652. Water Eddy Forces on Oscillating Cylinders, by Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker. (HY) Neighboring cylinders may increase drag force on vertical cylinders by 75% or decrease it to minus 20%, and may triple lift forces, for spacing to 3 diameters and cause significant deviations to 10 diameters. Neighboring cylinder eddies cause large force fluctuations.

2653. Flume Studies of Flow in Steep, Rough Channels, by Dean E. Peterson and P. K. Mohanty. (HY) Based on observations of both natural streams and flume experiments, three classifications of flow in steep, rough, open channels are proposed: tranquil, tumbling, and rapid. The tranquil and rapid regimes are dominated by subcritical and supercritical flow, respectively. In the tumbling regime, the roughness elements induce supercritical flow over their crests followed by individual hydraulic jumps to the tranquil state. The characteristics of flow in each of the proposed regimes are described, and criteria for delineating the regimes are proposed.

2654. Simply Supported Corner Plates, by Mario G. Salvadori and H. C. Reggini. (ST) A corner plate, simply supported on two parallel boundaries, each composed of two semi-infinite straight lines meeting at right angles, is uniformly loaded. Bending and twisting moments and shears and boundary reactions in the plate are determined by finite-difference integration of the corresponding boundary value problem. The penetration into the side strips of the disturbance represented by the corner is shown to be practically negligible at a distance from the

inner corner of the width of the side strips.

2655. Tests on Prestressed Concrete Embedded Cylinder Pipe, by Hugh F. Kennison. (HY) This paper presents the results of the first full-scale pressure and external load tests ever made in 60 in. prestressed concrete embedded cylinder pipe designed according to AWWA Specification C301. The structural behavior of this pipe under combined loads is reported, based on the development of stress cracks in the concrete and on strain recordings from SR-4 strain gages.

2656. Translations of Foreign Literature on Hydraulics, Third Progress Report of the Task Force on List of Translations of the Committee on Hydromechanics of the Hydraulics Division. (HY) In an attempt to bring to hydraulic engineers an up-to-date listing of translations of foreign literature on hydraulics, it is the intent of the task force preparing this report to issue, from time to time, progress reports containing suitable items. The present list is the third issued since the publication, in 1957, of ASCE Manual 35, entitled "A List of Translations of Foreign Literature on Hydraulics."

2657. Investigation of the Corrosive Behavior of Waters, by Werner Stumm. (SA) An interpretation is given to specific corrosive results obtained in field and laboratory investigations. The complex mutual interaction of corrosion stimulating and inhibiting factors (pH, buffer capacity, CaCO_3 deposition, and alkalinity) is treated.

2658. Design Considerations for California Marinas, by James W. Dunham. (WW) Considerations and criteria for the functional layout and structural design of marinas for small craft, as proposed by the California State Division of Small Craft Harbors, are presented. Examples of successful design practice are given, and recommendations are made for use of various types of material and design under different conditions of exposure.

2659. Discussion of Proceedings Paper 2175, 2318, 2422, 2507, 2528. (WW) John M. Weiss and Virgil Blancato on 2175. Basil W. Wilson on 2318. J. Th. Thjsse and W. D. Baines and H. J. Leutheusser on 2422. Robert E. Hickson and J. E. Deigman on 2507. Donald C. Hill on 2528.

2660. Tritium as a Ground Water Tracer, by W. J. Kaufman. (SA) Tritium is the form of tritiated water in a nearly perfect ground water tracer. Its only serious disadvantage is derived from its radioactive properties and the potential effects on public health of extremely small concentrations of radioisotopes. The potential biological risks of using tritium in large scale water tracing operations are treated and compared with the possible benefits.

2661. Simple Rules for Hot or Cold Weather Concreting, by John J. Manning. (CO) This article is prepared for ready reference by field forces in connection with concreting operations during hot or cold weather. It is a concise outline of the procedures for placing and curing concrete during periods of sub-normal and above-normal temperatures.

2662. Construction of Rocky Reach Hydroelectric Project, by W. N. Evans and J. H. Boyd. (CO) Rocky Reach Dam was built in areas protected by beams and circular sheetpile cells, as much as 75 ft high, installed to rock through boulders. The million cubic yards of concrete were made from locally available gravel by four 2 cu yd tilting mixers; it was transported in 4 cu yd buckets on semi-trailers to big whirler cranes on 100-ft high gantries for placing in heavily-built panel forms. Rock bolts were used to tie down a section of the dam in which fault planes were encountered.

2663. Derivation of Flow Equations for Sewage Sludges, by Vaughn C. Behn. (SA) This paper has been prepared to bring together the solution of equations that have been derived by others and reported in various texts, journal articles, and theses. The extent of coverage is limited to time-independent, non-Newtonian liquids flowing in capillary and rotational viscometers and smooth pipes.

2664. Discussion of Proceedings Paper 2358, 2483, (CO) Clara F. Derrington on 2358. Robert F. Borg on 2483.

2665. Discussion of Proceedings Paper 2018, 2311, 2335, 2339, 2639, 2429, 2438, 2449, 2452, 2469, 2478. (HY) Ralph W. Powell and Chesley J. Posey on 2018. N. Claes H. Fisherstroem on 2311. Ivan J. Moskvitino on 2335. F. F. Linaweaver, Jr., John C. Geyer, and Jerome B.

Wolff on 2339. D. V. Joglekar, W. J. Bauer, L. J. Tison, S. V. Chitale, A. Ryland Thomas, Mushtaq Ahmad, and Fier Luigi Romita on 2639. Samuel A. Greeley on 2429. Harold G. Golden and I. L. Trotter, Jr. on 2438. M. H. Diskin, Annabel L. Tong, K. M. Yao, and M. B. McPherson and J. V. Radziul on 2449. T. Blench on 2452. Praxitelis A. Argyropoulos on 2469. Bernard L. Golding on 2478.

2666. Discussion of Proceedings Paper 2408, 2411, 2472, 2479. (SA) J. M. Jordaan, Jr. on 2408. M. T. Garrett, Jr. on 2411. Robert V. Thomann, M. B. McPherson, and C. H. J. Hull on 2472. Samuel A. Greeley and C. Y. Hitchcock on 2479.

2667. Discussion of Proceedings Paper 2221, 2428, 2433, 2461, 2470, 2541. (ST) John Sherman on 2221. Warner Lansing on 2428. J. Lieblein on 2433. James R. Krusling on 2461. Paul G. Fluck and Floyd E. Schneider on 2470. Phillip L. Gould on 2541.

DECEMBER

Journals: Engineering Mechanics, Highways, Irrigation and Drainage, Soil Mechanics and Foundations, Structural.

2668. Stress Analysis of Rigid Frame Bridge with Inclined Legs, by Shih-yuan Cheng. (ST) Methods of direct moment distribution applied to the rigid frame bridges with inclined legs are introduced in this paper. A simplified method for influence line analysis is derived from the anti-symmetric loading condition formulas.

2669. Vortex Tube Sand Trap, by A. R. Robinson. (IR) Tests were made on a device that can be used for the removal of large sediments from canals. This material must be traveling as bed load in order to be trapped by the tube. Data from several investigations have been combined to develop general design information.

2670. Solution of Pressure Distribution Problem by Digital Computer, by U. W. Stoll. (SM) A general computer method for solving vertical pressure distribution in applied soil mechanics is presented in an attempt to retain a direct equivalence between the physical problem and the required computer notation and logic.

2671. Los Angeles Water Supply and Irrigation, by Samuel B. Morris. (IR) Los Angeles California imported new water supplies 240 miles and expanded its irrigated areas to afford early use for its aqueduct capacity. Irrigation caused replenishment of groundwater, increasing the city's water supply and the irrigator has

paid only about one-half the cost of the water served him.

2672. Method for Estimating Consumptive Use of Water for Agriculture, by Wendell C. Munson. (IR) This paper presents data on measured rates of consumptive use of water as well as estimated consumptive use determined by various formulas; it describes a procedure for determining monthly and annual water requirements, on a project basis, from climatological data for areas in which measurements of consumptive use are not available.

2673. Irrigation Systems of the Tigris and Euphrates Valleys, by Stanley S. Butler. (IR) The high potential for irrigation and the fluctuations in the status of actual development during the sixty centuries of irrigation in the Tigris and Euphrates valleys of Iraq are described. Increases in income since 1951, from oil production, made it possible to accelerate design and construction of dams, canals, and deep wells and to start a drainage program with American engineers and construction firms participating.

2674. Movements of a Cable Due to Changes in Loading, by James Michalos and Charles Birnstiel. (ST) A numerical method is presented for the determination of displacements along a suspended cable resulting from change in load. The effect of elastic deformations is included. The procedure is particularly suitable for programming for an electronic digital computer.

2675. Plastic Analysis of Shallow Conical Shells, by E. T. Onat. (EM) A complete solution is obtained for a rigid plastic, simply supported shallow conical shell loaded through a rigid central boss in which one is enabled to assess the effects of changes in geometry on the load carrying capacity of a circular plate.

2676. Drainage, a Vital Need in Irrigated, Humid Areas, by Albert L. King. (IR) The use and importance of drainage and supplemental irrigation in solving problems created by rainfall patterns in irrigated, humid areas is discussed; where supplemental irrigation is practiced, drainage is as important a factor as the provision of water for crops.

2677. L T S Design of Continuously Reinforced Concrete Pavement, by Benjamin F. McCullough and William B. Ledbetter. (HW) This paper is aimed at presenting a rational and uncomplicated approach to the approximate design of continuously reinforced concrete pavement considering all the factors and variables that can be evaluated by means of available engineering tools.

2678. Concepts of Structural Safety, by C. B. Brown. (ST) This paper presents methods of providing engineering safety and additional safety necessary for social purposes. Ratio, prob-

ability, and combined ratio and probability are considered. Functional and collapse failure and the concept of structural life in design are discussed.

2679. End-Fixity Effect on Vibration and Instability, by David Burgreen. (EM) A study is made of the effect of arbitrary elastic end-fixity on the instability of columns and on the frequency of vibration on beams in which the significance and influence of negative end-fixity on buckling and vibration is examined. Simple expressions relating instability load and frequency of vibration to end-fixity are proposed.

2680. Periods of Framed Buildings for Earthquake Analysis, by Mario G. Salvadori and Ewald Heer. (ST) The shear, bending, rocking, and translational periods of cantilever beams with linearly varying shear and flexural rigidities, and with or without a concentrated mass at their top, are computed and combined to obtain a formula for the approximate evaluation of periods of framed buildings.

2681. Tuttle Creek Dam of Rolled Shale and Dredged Sand, by K. S. Lane and R. G. Fehrman. (SM) This paper covers the earthwork and foundation aspects of the project of which the more unusual features are closure "in the wet" and the handling of weak clay foundation partially by excavation and partially by exceptionally wide berms. Included were major volumes of shale-limestone constructed as a rolled fill and sand deposited by dredging into place two types of fill not commonly used in present-day earth dam construction.

2682. Humid Zone Irrigation in Ceylon, by Phillip P. Dickinson. (IR) The development of irrigation in humid Ceylon through the centuries up until today (1960) is discussed. A major problem is the abnormal duty of irrigation water for rice culture.

2683. Dewatering the Port Allen Lock Excavation, by Charles L. Mansur and Robert I. Kaufman. (SM) This paper explains the functions of thirty-six large diameter deep wells that were installed around the top of the excavation for Port Allen Lock for the purpose of lowering the hydrostatic head in the deep stratum of previous sand that lies beneath the lock.

2684. Stress Conditions in Triaxial Compression, by A. Balla. (SM) A new solution is developed for the stress conditions of a cylindrical test specimen with any length-diameter ratio and subjected to axial and radial external loads.

2685. Climate and Crops in Humid Areas, by J. A. Riley and P. H. Grissom. (IR) The different aspects of climate as important influences on designing engineering procedures for increased farm efficiency and their effect on crops in humid areas are discussed.

2686. Brittle Fracture, by B. L. Averbach. (EM) The correlations between theories and experiments on brittle cleavage fractures in iron are developed herein.

2687. Ductility and the Strength of Metallic Structures, by J. M. Frankland. (EM) The need for the designer to consider ductility as an important factor in his design and to assume it to be implicit in his design is emphasized in this paper. The history of design prior to the discovery of mild steels is mentioned together with the early arguments of elastic versus plastic design. The meaning of ductility and the factors that may affect its testing are enumerated.

2688. Fatigue of Structural Materials, by Horace J. Grover. (EM) The current state of knowledge about the fatigue properties of structural materials is reviewed. The progress being made, in the case of metallic alloys, toward relating fatigue damage to behavior of dislocations in the crystalline lattice is enumerated.

2689. Metallurgical Advances and Civil Engineering, by Glenn Murphy. (EM) Emphasis is placed on the applicability of materials studies to all phases of civil engineering. Preceding papers of the symposium are commented on, and the historical aspects of materials studies are noted as well as the need for new studies to clear up areas of confusion.

2690. Elasto-Plastic Analysis by Numerical Procedures, by Annabel L. Tong. (EM) An elasto-plastic analysis for the bending and buck-

ling of prismatic and structural members by numerical procedures is presented. A stress-strain diagram composed of two straight-line segments is used to approximate the actual stress-strain diagram of the material, simplifying the computations and giving reasonably good accuracy for materials having defined stress-strain diagrams.

2691. Discussion of Proceedings Paper 2197, 2199, 2497, 2500, 2502, 2505, 2516. (EM) G. N. Bycroft, M. J. Murphy, and K. J. Brown on 2197. William A. Bradley on 2199. Edward L. Wilson on 2497. E. F. Masur on 2500. Iqbal Ali on 2502. L. F. Stephens on 2505. O. C. Zienkiewicz on 2516.

2692. Progress Report of the Joint ASCE-ACI Committee in Composite Construction. (ST) This progress report includes recommendations for the design of structures containing prefabricated beams acting compositely with a cast-in-place reinforced concrete slab. Beams made of precast reinforced concrete, of precast prestressed concrete, or of steel sections are included.

2693. Structural Model Analysis by Means of Moire Fringes, by A. J. Durelli and T. M. Daniel. (ST) The objective of this paper is to demonstrate the use of moire fringe in the measurement of displacements and rotations in structural models. The method gave results in satisfactory agreement with theory whenever such comparison was made. The techniques used are simple and inexpensive.

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- "Apron Design for Light Airplanes," Kenneth K. Wilde (May AT1:2462)
- "Elastic Model Design of the B-58 Airplane," J. W. Wells and H. B. England (August EM4:153:2580)
- "Topographic Mapping in Alaska," Reynold S. Isto (Feb SU1:2388)

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- "Airphoto Interpretation for Airfield Site Location," James H. McLerran (May AT1:2467)
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- "Containment Studies for an Atomic Power Plant," William McGuire and Gordon P. Fisher (June PO3:2508)
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"Electrical Analog Computer for Limit Design of Structures," M. Zaid and F. L. Ryder (Jan EM1:1:2331)

"Evaluation of Alternative Subway Routes," B. A. Griffith and H. G. von Cube (May CP1:2462)

"Generalized Distribution Network Head Loss Characteristics," M. B. McPherson (Jan HY1:75:2339)

"Highway Location and Design by Photogrammetric-Electronic Computer," S. E. Ridge (Feb SU1:2380)

"Hydrologic Studies by Electronic Computers in TVA," Willard M. Snyder (Feb HY2:1:2362)

"The Impact of Computers on Engineering Education," Gordon P. Fisher (Apr ST4:1:2428)

"Matrix Formulation of the Folded Plate Equations," A. C. Scordellis (Oct ST10:2617)

"Movements of a Cable Due to Changes in Loading," James Michalos and Charles Birnstiel (Dec ST12:23:2674)

"Some Basic Concepts in Matrix Structural Analysis," Frank R. Berman (Aug ST7:59:2582)

"White Noise Representation of Earthquakes," G. N. Bycroft (Apr EM2:1:2434)

CONCRETE (General)

"Concrete Addition to Cellular Sheet Pile Shipway," John W. Irvine and Richard F. Gaston (May CO2:2493)

"Construction of Rocky Reach Hydroelectric Project," W. N. Evans and J. H. Boyd (Nov CO3:45:2662)

"Control of Cracking in TVA Concrete Gravity Dams," Walter F. Emmons, Olav Lavik, and Poul I. Hornby (Feb PO1:11:2372)

"Epoxy Asphalt Concrete for Airfield Pavements," W. C. Simpson, H. J. Sommer, R. L. Griffin, and T. K. Miles (May AT1:2466)

"Epoxy Resin for Structural Repair of Concrete Pavement," Wilson L. Davis and Eugene Pinkstaff (Feb ST2:2360)

"Freezing and Thawing Effects on Prestressed Concrete," M. J. Gutzwiller and F. E. Musleh (Oct ST10:2633)

"Polyvinyl Acetate and Portland Cement Mortars," Robert T. Howe (Feb ST2:2358)

"Properties of Steel and Concrete and the Behavior of Structures," George Winter (Feb ST2:2384)

"The Shell Vault of the Exposition Palace, Paris," Nicolas Esquillon (Jan ST1:41:2347)

"Simple Rules for Hot or Cold Weather Concreting," John J. Manning (Nov CO3:37:2661)

"Test on a 120-ft-Span Prestressed Concrete Beam," G. D. Base and R. E. Rowe (Sep ST9:2608)

CONCRETE (General) Continued

- "Tetrapods and Other Precast Blocks for Breakwaters," P. Daniels, E. Chapus, and R. Dhaille (Sept WW3:2590)

CONCRETE, PRESTRESSED

- "Freezing and Thawing Effects on Prestressed Concrete," M. J. Gutzwiller and F. E. Musleh
- "Long Span Prestressed Concrete Folded Plate Roofs," John C. Brough, Jr. and B. H. Stephens, Jr. (Oct ST10:2630)
- "Orthogonal Gridworks Loaded Normally to Their Planes," Ignacio Martin and José Hernandez (Jan ST1:1:2344)
- "Research on Fire Resistance of Prestressed Concrete," Hubert Woods (Nov ST11:53:2640)
- "Tentative Recommendations for the Design and Construction of Composite Beams and Girders for Buildings: Progress Report, Joint ASCE-ACI Committee on Composite Construction," Philip P. Page, Chmn. (Dec ST12:73:2692)
- "Test on a 120-ft-Span Prestressed Concrete Beam," G. D. Base and R. E. Rowe (Sept ST9:2608)
- "Tests on Prestressed Concrete Embedded Cylindrical Pipe," Hugh F. Kennison (Nov HY9:77:2655)

CONCRETE, REINFORCED

- "Charts for Design of Reinforced Concrete Columns," W. H. Gardner, Jr. and Donald H. Kline (May ST5:2461)
- "Limit Design of Reinforced Concrete Beams," D. T. Wright and C. Berwanger (July ST7:1:2541)
- "Load Distribution in Composite Girder-Slab Systems," G. Hondros and J. G. Marsh (Nov ST11:79:2645)
- "LTS Design of Continuously Reinforced Concrete Pavement," Benjamin F. McCullough and William B. Ledbetter (Dec HW4:1:2677)
- "Membrane Stresses in Hyperboloid Shells of Revolution," Placido Cicala (Oct EM5:2628)
- "Reinforced Concrete Pavements for Airports," August W. Compton (May AT1:2460)
- "Reinforced Concrete Shear Wall Assemblies," Jack R. Benjamin and Harry A. Williams (Aug ST8:1:2566)
- "Review of Research on Composite Steel-Concrete Beams," Ivan M. Vliest (June ST6:2496)
- "Simply Supported Corner Plate," Mario G. Salvadori and H. G. Reggini (Nov ST11:141:2654)
- "Tentative Recommendations for the Design and Construction of Composite Beams and Girders for Buildings: Progress Report, Joint ASCE-ACI Committee on Composite Construction," Philip P. Page, Chmn. (Dec ST12:73:2692)
- "Ultimate Strength of Over-Reinforced Beams," Ladislav B. Kriz and Seng-Lip Lee (June EM3:2502)

CONSTRUCTION

- "Canadian Section of the St. Lawrence Seaway," Lawrence H. Burpee (Mar WW1:2420)
- "Concrete Addition to Cellular Sheet Pile Shipway," John W. Irvine and Richard F. Gaston (May CO2:2493)
- "Construction of Morrison Bridge," Raymond D. Bane (May CO2:2482)
- "Construction of Rocky Reach Hydroelectric Project," W. N. Evans and J. H. Boyd (Nov CO3:2662)
- "Control of Ground Water in Excavations," W. F. Swiger (Feb ST2:2359)

- "Design and Construction of Navy's Largest Drydock," S. P. Zola and P. M. Boothe (Mar WW1:2421)

"Design of Karadj Hydroelectric Project," Richard D. Harza and Robert F. Edbrooke (Aug PO4:31:2579)

- "Epoxy Resin for Structural Repair of Concrete Pavement," Wilson L. Davis and Eugene Pinkstaff (Feb ST2:2360)

"Experience with a Pier-Supported Building over Permafrost," H. B. Dickens and C. M. Gray (Oct SM5:2618)

- "Field Office Bookshelf: Progress Report, Committee on Publications, Construction Division," Morton D. Morris, Chmn. (Feb ST2:2357)

"Fundamentals of Arctic Blasting," Clifton W. Livingston (Feb ST2:2355)

- "Installation and Operation of Dewatering Systems," David A. Werblin (Feb SM1:47:2389)

"Long Span Prestressed Concrete Folded Plate Roofs," John C. Brough, Jr. and B. H. Stephens, Jr. (Oct ST10:2630)

- "New Tools and Techniques for Dewatering," Byron J. Prugh (Feb ST2:2356)

"Photographic Analysis for Construction Operations," John W. Fondahl (May CO2:2483)

- "Plan for Closure of Old River," George M. Cookson (Sept WW3:2602)

"Polyvinyl Acetate and Portland Cement Mortars," Robert T. Howe (Feb ST2:2358)

- "The Shell Vault of the Exposition Palace, Paris," Nicolas Esquillon (Jan ST1:41:2347)

"Simple Rules for Hot or Cold Weather Concrete," John J. Manning (Nov CO3:37:2661)

- "Soil Freezing to Reconstruct a Railway Tunnel," George J. Low (Nov CO3:1:2639)

"Statistical and Economic Analysis of a Bidding Trend," Marvin Gates (Nov CO3:13:2651)

- "Tentative Recommendations for the Design and Construction of Composite Beams and Girders for Buildings: Progress Report, Joint ASCE-ACI Committee on Composite Construction," Philip P. Page, Chmn. (Dec ST12:73:2692)

CONTRACTS

- "Statistical and Economic Analysis of a Bidding Trend," Marvin Gates (Nov CO3:13:2651)

CORROSION

- "Investigation of the Corrosive Behavior of Waters," Werner Stumm (Nov SA6:27:2657)
- "Waste Treatment at the Shippingport Reactor," J. R. LaPointe, W. J. Hahn, and E. D. Harward, Jr. (May SA3:2481)

COSTS, BREAKWATER

- "Breakwaters in the Hawaiian Islands," Robert Q. Palmer (June WW2:2507)
- "Sand By-Passing Project for Shark River Inlet," W. Mack Angus (Sept WW3:2599)

COSTS, CANAL

- "Arkansas River Plan," William Whipple (Sept WW3:2597)

COSTS, CONSTRUCTION

- "Canadian Section of the St. Lawrence Seaway," Lawrence H. Burpee (Mar WW1:2420)
- "Long Span Prestressed Concrete Folded Plate Roofs," John C. Brough, Jr. and B. H. Stephens, Jr. (Oct ST10:2630)
- "Minimum Cost Design of Large Support Rings," Kenneth P. Buchert (May ST5:2473)
- "Statistical and Economic Analysis of a Bidding Trend," Marvin Gates (Nov CO3:13:2651)

COSTS, FLOOD

- "Strategic Aspects of Urban Flood-Plain Occupation," Gilbert F. White (Feb HY2:89:2376)

COSTS, HIGHWAY AND ROAD

- "Correlation of Vehicle Design and Highway Design," Richard A. Haber and David K. Witheford (June HW2:2529)

COSTS, SEWAGE DISPOSAL

- "Design and Cost Considerations in High Rate Sludge Digestion," Alfred A. Estrada (May SA3:2479)
- "Regional Planning in Cuyahoga County, Ohio," Alfred A. Estrada (May SA3:2741)

COSTS, WATER

- "Role of Price in the Allocation of Water Resources," Lawrence G. Hines (Jan SA1:15:2343)

CURVES

- "The Calculating Machine in Coordinate Geometry," Bela Vadasz (Feb SU1:7:2367)
- "Charts for Design of Reinforced Concrete Columns," W. H. Gardner, Jr. and Donald H. Kline (May ST5:2461)
- "Flood-Frequency Relationships in the Pacific Northwest," George L. Bodhaine (Nov HY9:1:2644)
- "The Fourth Root n-f Diagram," T. Blench (Jan HY1:63:2340)
- "Intersection of Straight Line with Spiral," T. F. Hickerson (Feb SU1:2379)
- "Physical Characteristics of Drainage Basins," Bernard L. Golding and Dana E. Low (Mar HY3:2409)
- "Self-Checking Method of Computing Curve Elevations," Charles M. Lamont (Feb SU1:1:2365)
- "Tolkmitt's Backwater and Dropdown Curve Tables," R. D. Goodrich (May HY5:2469)

DAMS, ARCH

- "Arch Dams Analysis with an Electric Analog Computer," Richard H. MacNeal (Aug EM4:127:2578)
- "Comparative Study of a Segmental Arch Ring," O. C. Zienkiewicz (Jan EM1:19:2332)
- "Design of Arch Dams by Trial Load Method of Analysis," Merlin D. Copen (Aug PO4:13:2569)
- "Digital Computers for Trial-Load Analysis of Arch Dams," L. R. Scrivener (Aug PO4:1:2568)
- "Italian Arch Dam Design and Model Confirmation," Guido Oberti (Mar ST3:2410)

DAMS, EARTH

- "Hydrology and Flood Control Features at Oroville Dam," Joseph I. Burns, Kenneth B. Mayo, and William A. Arvola (Nov WW4:33:2648)
- "Tuttle Creek Dam of Rolled Shale and Dredged Sand," K. S. Lane and R. G. Fehrman (Dec SM6:11:2670)

DAMS (General)

- "Trap Efficiency of Reservoirs, Debris Basins, and Debris Dams," Charlie M. Moore, Walter J. Wood, and Graham W. Renfro (Feb HY2:69:2374)

DAMS, MASONRY AND CONCRETE

- "Construction of Rocky Reach Hydroelectric Project," W. N. Evans and J. H. Boyd (Nov CO3:45:2662)
- "Control of Cracking in TVA Concrete Gravity Dams," Walter F. Emmons, Olay Lavik, and Poul L. Hornby (Feb PO1:11:2372)

DAMS, ROCKFILL

- "Furnas Hydroelectric Project," James W. Libby (Apr PO2:1:2430)

DAMS, ROCKFILL (Geographical)

- BRAZIL**
- "Furnas Hydroelectric Project," James W. Libby (Apr PO2:1:2430)

DAMS, ROCKFILL (Name)

- FURNAS**
- "Furnas Hydroelectric Project," James W. Libby (Apr PO2:1:2430)

DRAINAGE

- "Climate and Crops in Humid Areas," J. A. Riley and P. H. Grissom (Dec IR4:107:2685)
- "Drainage, a Vital Need in Irrigated Humid Areas," Albert L. King (Dec IR4:81:2676)
- "Installation of Drain Tile for Subsurface Drainage," John G. Sutton (Sept IR3:2591)
- "Irrigation and Drainage Potential in Humid Areas," Marion Clifford Boyer (Sept IR3:2593)
- "Irrigation and Drainage Problems in Uruguay," J. E. Christiansen (June IR2:2494)
- "Irrigation Systems of the Tigris and Euphrates Valleys," Stanley S. Butler (Dec IR4:59:2673)
- "Method for Estimating Consumptive Use of Water for Agriculture," Wendell C. Munson (Dec IR4:45:2672)
- "Physical Characteristics of Drainage Basins," Bernard L. Golding and Dana E. Low (Mar HY3:2409)

DREDGES AND DREDGING

- "Tuttle Creek Dam of Rolled Shale and Dredged Sand," K. S. Lane and R. G. Fehrman (Dec SM6:2670)

EARTHQUAKES

- "Dynamic Analysis of Elasto-Plastic Structures," Glen V. Berg and Donald A. DaDeppo (Apr EM2:35:2440)
- "Dynamic Effects of Earthquakes," Ray W. Clough (Apr ST4:49:2437)
- "Periods of Framed Buildings for Earthquake Analysis," Mario G. Salvadori and Ewald Heer (Dec ST12:59:2680)
- "Various Instability Modes of the Fixed Base Column," D. A. Sawyer (July ST7:61:2554)
- "White Noise Representation of Earthquakes," G. N. Bycroft (Apr EM2:1:2434)

ECONOMICS

- "Correlation of Vehicle Design and Highway Design," Richard A. Haber and David K. Witheford (June HW2:2529)
- "Hydroelectric Possibilities and Influence of Load Growth," S. P. McCasland (Apr PO2:29:2435)
- "Role of Price in the Allocation of Water Resources," Lawrence G. Hines (Jan SA1:15:2343)
- "Statistical and Economic Analysis of a Bidding Trend," Marvin Gates (Nov CO3:13:2651)

EDUCATION

- "Civil Engineering Curriculum for Federal Surveying and Mapping," G. C. Tewinkel (Feb SU1:2387)
- "The Impact of Computers on Engineering Education," Gordon P. Fisher (Apr ST4:1:2428)
- "Surveying in the Civil Engineering Curriculum," Kenneth S. Curtis (Feb SU1:2386)

ELASTICITY

- "Experimental Study of Beams on Elastic Foundations," Robert L. Thoms (June EM3:2505)

EMPLOYEES AND EMPLOYMENT

- "Civil Engineering Curriculum for Federal Surveying and Mapping, G. C. Tewinkel (Feb SU1:2387)

ENGINEERING MECHANICS

- "Aircraft Structural Analysis on an Analog Computer," W. J. Brignac and R. G. Schwendler (June EM3:2499)
- "Analysis of Frames with Nonlinear Behavior," Alfredo Hua-Sing Ang (June EM3:2497)
- "Arch Dam Analysis with an Electric Analog Computer," Richard H. MacNeal (Aug EM4:127:2578)
- "Asymmetrical Bending of Conical Shells," Bayard Wilson (June EM3:2510)
- "Bearing Capacity of Floating Ice Sheets," G. G. Meyerhof (Oct EM5:2627)
- "Behavior of Buckled Rectangular Plates," Manuel Stein (Apr EM2:59:2445)
- "Behavior of Viscoelastic Plates in Bending," George E. Mase (June EM3:2498)
- "Bending of Plates on a Viscoelastic Foundation," K. S. Pister and M. L. Williams (Oct EM5:2619)
- "Commentary on Plastic Design in Steel: Compression Members: Progress Report No. 5, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (Jan EM1:117:2342)
- "Commentary on Plastic Design in Steel: Connections: Progress Report, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," (Apr EM2:107:2453)
- "Commentary on Plastic Design in Steel: Deflections: Progress Report, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (Apr EM2:107:2454)
- "Comparative Study of a Segmental Arch Ring," O. C. Zienkiewicz (Jan EM1:19:2332)
- "Deflection Stability of Frames under Repeated Loads," E. P. Popov and R. E. McCarthy (Jan EM1:61:2334)
- "Design of Circular Plates Based on Plastic Limit Load," L. W. Hu (Jan EM1:91:2338)
- "Dynamic Analysis of Elasto-Plastic Structures," Glen V. Berg and Donald A. DaDeppo (Apr EM2:35:2440)
- "Dynamic Response of Beams Traversed by Two-Axle Loads," Robert K. Wen (Oct EM5:2624)
- "Elastic Model Design of the B-58 Airplane," J. W. Wells and H. B. England (Aug EM4:153:2580)
- "Elastic-Plastic Analysis of Transversely Loaded Plates," John F. Brothie (Oct EM5:2622)
- "Elasto-Plastic Analysis by Numerical Procedures," Annabel L. Tong (Dec EM6:73:2690)
- "Electrical Analog Computer for Limit Design of Structures," M. Zaid and F. L. Ryder (Jan EM1:1:2331)
- "Electrical Energy Analogs of Vibrating Beams," Frederick L. Ryder (Oct EM5:2620)
- "End-Fixity Effect on Vibration and Instability," David Burgreen (Dec EM6:13:2679)
- "Experimental Study of Beams on Elastic Foundations," Robert L. Thoms (June EM3:2505)
- "Geometry of Moire Fringes in Strain Analysis," Stanley Morse, August J. Durelli, and Cesar A. Sciammarella (Aug EM4:105:2576)
- "Irrotational Motion of Two Fluid Strata Towards a Line Sink," D. G. Huber (Aug EM4:71:2573)
- "Lateral Stability of Frames by Energy Method," Donald E. Johnson (Aug EM4:23:2567)
- "Membrane Stresses in Hyperboloid Shells of Revolution," Placido Cicala (Oct EM5:2628)
- "Periodical Gravity Wave on a Discontinuity," Bernard LeMeaute (Nov HY9:11:2646)
- "Periods of Framed Buildings for Earthquake Analysis," Mario G. Salvadori and Ewald Heer (Dec ST12:59:2680)
- "Physical Metallurgy and Mechanical Properties: Brittle Fracture," B. L. Averbach (Dec EM6:29:2686)
- "Physical Metallurgy and Mechanical Properties of Materials: Ductility and the Strength of Metallic Structures," J. M. Frankland (Dec EM6:45:2687)
- "Physical Metallurgy and Mechanical Properties of Materials: Fatigue of Structural Materials," Horace J. Grover (Dec EM6:53:2688)
- "Physical Metallurgy and Mechanical Properties of Materials: Metallurgical Advances and Civil Engineering," Glenn Murphy (Dec EM6:65:2689)
- "Plastic Analysis of Shallow Conical Shells," E. T. Onat (Dec EM6:1:2675)
- "Principle of Virtual Work in Structural Analysis," Frank DiMaggio (Nov ST11:65:2643)
- "Relaxation Theory of Creep of Metals," Francis H. Ree, Taikyue Ree, and Henry Eyring (Jan EM1:41:2333)
- "Restrained Columns," Morris Ojalvo (Oct EM5:2615)
- "Seepage Losses from Parallel Canal Systems," H. Y. Hammad (Aug EM4:43:2571)
- "Simply Supported Corner Plate," Mario G. Salvadori and H. G. Reggini (Nov ST11:141:2654)
- "Strength and Efficiency Aspects of Plate Structures," George Gerard (Apr EM2:17:2439)
- "Stresses in Layered Elastic Solids," M. M. Lemcoe (Aug EM4:1:2565)
- "Travelling Loads on Rigid-Plastic Beams," P. S. Symonds and B. G. Neal (Jan EM1:79:2337)
- "Ultimate Strength of Over-Reinforced Beams," Ladislav B. Kriz and Seng-Lip Lee (June EM3:2502)
- "Underground Structures Subject to Air Overpressure," Ernest T. Selig, Keith E. McKee, and Eben Vey (Aug EM4:87:2575)
- "Vibrations and Stability of Plates Under Initial Stress," George Herrmann and Anthony E. Armenakas (June EM3:2500)
- "Vibrations of Structural Systems by Component Mode Synthesis," Walter C. Hurty (Aug EM4:51:2571)
- "Water Eddy Forces on Oscillating Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker (Nov HY9:43:2652)

ENGINEERING MECHANICS Continued

- "Waves and Shocks in Locking and Dissipative Media," Mario G. Salvadori, Richard Skalak, and Paul Weidinger (Apr EM2:77:2447)
- "White Noise Representation of Earthquakes," G. N. Bycroft (Apr EM2:1:2434)
- "Wind Stresses in Domes," P. Gondikas and M. G. Salvadori (Oct EM5:2616)

ENGINEERS AND ENGINEERING

- "Aerial Photography in Arctic and Subarctic Engineering," Robert E. Frost (May AT1:2463)
- "The Builder of the Newport (Rhode Island) Tower," Edward Adams Richardson (Feb SU1:2383)
- "Civil Engineering Curriculum for Federal Surveying and Mapping," G. C. Tewinkel (Feb SU1:2387)
- "Early History of Hydrometry in the United States," Steponas Kolupaila (Jan HY1:2335)
- "The Impact of Computers on Engineering Education," Gordon P. Fisher (Apr ST4:1:2428)
- "Surveying in the Civil Engineering Curriculum," Kenneth S. Curtis (Feb SU1:2386)

FAILURES (General)

- "Accident Preparedness in Reactor Waste Treatment," E. D. Harward (July SA4:1:2543)
- "Concepts of Structural Safety," C. B. Brown (Dec ST12:39:2678)
- "Freezing and Thawing Effects on Prestressed Concrete," M. J. Gutzwiller and F. E. Musleh (Oct ST10:2633)
- "Reinforced Concrete Shear Wall Assemblies," Jack R. Benjamin and Harry A. Williams (Aug ST8:1:2566)
- "Static Tension Tests of Compact Bolted Joints," Robert T. Foreman and John L. Rumpf (June ST6:2523)
- "Tests on a 120-ft-Span Prestressed Concrete Beam," G. D. Base and R. E. Rowe (Sept ST9:2608)

FILTERS AND FILTRATION

- "Activated Carbon Removal of Hydrogen Sulfide," R. S. Murphy and I. W. Santry, Jr. (Nov SA6:1:2641)
- "Seepage Requirements of Filters and Pervious Bases," Harry R. Cedergren (Oct SM5:2623)

FLOODS (General)

- "Conservancy Districts as Flood Control Organizations," Cloyde C. Chambers (Apr HY4:1:2429)
- "Effects of Flood Flow on Channel Boundaries," D. A. Parsons (Apr HY4:21:2443)
- "New Approach to Local Flood Problems," Herbert D. Vogel (Jan HY1:53:2336)
- "Plan for Closure of Old River," George M. Cookson (Sept WW3:2602)
- "Predicting Storm Runoff on Small Experimental Watershed," Neal E. Minshall (Aug HY8:17:2577)
- "Scour at Bridge Crossings," Emmet M. Laursen (Feb HY2:39:2369)
- "Strategic Aspects of Urban Flood-Plain Occupance," Gilbert F. White (Feb HY2:89:2376)

FLOODS (Geographical)

ARIZONA

- "Flow Losses in the Lower Gila River," Lawrence F. Pratt (June HY6:2521)

CALIFORNIA

- "Bank Protection on Central Valley Streams, California," R. W. Barsdale (Nov WW4:1:2642)
- "Hydrology and Flood Control Features at Oroville Dam," Joseph I. Burns, Kenneth B. Mayo, and William A. Arvola (Nov WW4:33:2648)
- IRAQ
 - "Heritage of Irrigation in Iraq," M. R. Lewis (June IR2:2495)
- OLD RIVER
 - "Flood Distribution Problems Below Old River," Frederic M. Chatry (Aug HY8:1:2570)
- PACIFIC NORTHWEST
 - "Flood-Frequency Relationships in the Pacific Northwest," George L. Bodhaine (Nov HY9:2644)
- TENNESSEE
 - "New Approach to Local Flood Problems," Herbert D. Vogel (Jan HY1:53:2336)

FLUMES

- "World Practices in Water Measurements in Turnouts," Charles W. Thomas (June IR2:2530)
- "Flume Studies of Flow in Steep, Rough Channels," Dean F. Peterson and P. K. Mohanty (Nov HY9:55:2653)

FOUNDATIONS, AIRPORT

- "Bearing Capacity of Floating Ice Sheets," G. G. Meyerhof (Oct EM5:2627)
- "Roadbeds on Highways and Airport Runways," Ira B. Mullis (Mar HW1:2412)

FOUNDATIONS, (General)

- "Aerial Photography in Arctic and Subarctic Engineering," Robert E. Frost (May AT1:2463)
- "Anchored Bulkhead Design by Numerical Method," F. E. Richart, Jr. (Feb SM1:29:2373)
- "Bearing Capacity of Floating Ice Sheets," G. G. Meyerhof (Oct EM5:2627)
- "Bending of Plates on a Viscoelastic Foundation," K. S. Pister and M. L. Williams (Oct EM5:2619)
- "Control of Ground Water in Excavations," W. F. Swiger (Feb ST2:2359)
- "Discontinuity Stresses in Beams on Elastic Foundations," Joseph Penzien (Apr ST4:67:2441)
- "Dynamic Testing of Pavements," W. Heukelom and C. R. Foster (Feb SM1:1:2368)
- "Experience with a Pier-Supported Building over Permafrost," H. B. Dickens and C. M. Gray (Oct SM5:2618)
- "Experimental Study of Beams on Elastic Foundations," Robert L. Thoms (June EM3:2505)
- "Foundation Vibrations," F. E. Richart, Jr. (Aug SM4:1:2564)
- "Generalized Solutions for Laterally Loaded Piles," Hudson Matlock and Lymon C. Reese (Oct SM5:2626)
- "Influence of Partial Base Fixity on Frame Stability," Theodore V. Galambos (May ST5:2480)
- "Installation and Operation of Dewatering Systems," David A. Werblin (Feb SM1:47:2389)
- "New Tools and Techniques for Dewatering," Byron J. Prugh (Feb ST2:2356)
- "Pile-Driving Analysis by the Wave Equation," E. A. L. Smith (Aug SM4:35:2574)
- "Pile Driving Experiences at Port Everglades," T. J. Lynch (Apr SM2:41:2442)
- "Regla Steam Electric Station," George T. Ingalls (June PO3:2520)
- "Seepage Requirements of Filters and Pervious Bases," Harry R. Cedergren (Oct SM5:2623)

FOUNDATIONS, HIGHWAY AND ROAD

- "Dynamic Testing of Pavements," W. Heukelom and C. R. Foster (Feb SM1:1:2368)
- "Roadbeds on Highways and Airport Runways," Ira B. Mullis (Mar HW1:2412)

FRAMES

- "Aircraft Structural Analysis on an Analog Computer," W. J. Brignac and R. G. Schwendler (June EM3:2499)
- "Analysis of Frames with Nonlinear Behavior," Alfredo Hua-Sing Ang (June EM3:2479)
- "Bar-Chain Method for Analyzing Truss Deformation," S. L. Lee and P. C. Patel (May ST5:2477)
- "Buckling of One-Story Frames and Buildings," John E. Goldberg (Oct ST10:2629)
- "Commentary on Plastic Design in Steel: Compression Members: Progress Report No. 5, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (Jan EM1:117:2342)
- "Deflection Stability of Frames under Repeated Loads," E. P. Popov and R. E. McCarthy (Jan EM1:61:2334)
- "Effective Length of Framed Columns," Thomas C. Kavanagh (Feb ST2:2363)
- "Influence of Partial Base Fixity on Frame Stability," Theodore V. Galambos (May ST5:2480)
- "Lateral Stability of Frames by Energy Method," Donald E. Johnson (Aug EM4:23:2567)
- "Matrix Analysis of Plane Rigid Frames," Fernando Venancio Filho (July ST7:95:2547)
- "Periods of Framed Buildings for Earthquake Analysis," Mario G. Salvadori and Ewald Heer (Dec ST12:59:2680)
- "Secondary Stresses in Parallel Wire Suspension Cables," Thomas Alan Wyatt (July ST7:37:2542)
- "Stress Analysis of Rigid Frame Bridges with Inclined Legs," Shih-Yuan Cheng (Dec ST12:1:2668)
- "Structural Model Analysis by Means of Moire Fringes," A. J. Durelli and I. M. Daniel (Dec ST12:93:2693)
- "Use of Continuity-Factor and Final Position," Yon-Sun Chou (Nov ST11:1:2637)
- "Various Instability Modes of the Fixed Base Column," D. A. Sawyer (July ST7:61:2544)

FRICTION

- "Drag Coefficients of Locomotion over Viscous Solids," Ervin Hegedus and Robert S. Rowe (Apr SM2:63:2448)

FRICTION COEFFICIENTS, FLUID

- "Drag Forces in Velocity Gradient Flow," Frank D. Masch and Walter L. Moore (July HY7:1:2546)
- "The Fourth Root n -f Diagram," T. Blench (Jan HY1:63:2340)
- "Friction Losses on Lines with Service Connections," David L. Muss (Apr HY4:35:2449)
- "Generalized Distribution Network Head Loss Characteristics," M. B. McPherson (Jan HY1:75:2339)

GAGES, STREAM

- "Early History of Hydrometry in the United States," Steponas Kolupaila (Jan HY1:1:2335)

GIRDERS

- "Load Distribution in Composite Girder-Slab Systems," G. Hondros and J. G. Marsh (Nov ST11:79:2645)

- "Stability Considerations in the Design of Steel Plate Girders," Charles E. L. Massonnet (Jan ST1:71:2350)

- "Test of a Riveted Plate Girder with a Thin Web," Desi D. Vasarhelyi, Jim C. Taylor, Naresh C. Vasisht, and Chia-Yao Yuan (Oct ST10:2621)

GROUND WATER

- "Computer Applications in Groundwater Hydrology," Joseph Foley (Sept IR3:2598)
- "Control of Ground Water Excavations," W. F. Swiger (Feb ST2:2359)
- "Geophysical Procedures in Ground Water Study," H. R. McDonald and Dart Wantland (Sept IR3:2598)
- "Installation and Operation of Dewatering Systems," David A. Werblin (Feb SM1:47:2389)
- "Installation of Drain Tile for Subsurface Drainage," John G. Sutton (Sept IR3:2591)
- "Scales of Viscous Analogy Models for Ground Water Studies," Jacob Bear (Feb HY2:11:2364)
- "Tritium as a Ground Water Tracer," W. J. Kaufman (Nov SA6:47:2660)
- "Unsteady Flow of Ground Water into a Surface Reservoir," William Haushild and Gordon Kruse (July HY7:13:2551)

HARBORS (General)

- "Analysis of Load Distribution in the Piles of Piers," M. A. Gouda (June WW2:2534)
- "Canadian Section of the St. Lawrence Seaway," Lawrence H. Burpee (Mar WW1:2420)
- "Design and Construction of Navy's Largest Drydock," S. P. Zola and P. M. Boothe (Mar WW1:2421)
- "Design of Inlets for Texas Coastal Fisheries," H. P. Carothers and Homer C. Innis (Sept WW3:2603)
- "Hydrodynamic Wave Pressure on Breakwaters," M. A. Gouda (Mar WW1:2414)
- "Navigation Model Studies of New Ohio River Locks," Eugene P. Fortson, Jr. and George B. Fenwick (June WW2:2518)
- "Periodical Gravity Wave on a Discontinuity," Bernard Le Mehaute (Nov HY9:11:2646)
- "Pneumatic Barrier Against Salt Water Intrusion," Ian Larsen (Sept WW3:2600)
- "Prediction of Maximum Practical Berth Occupancy," Thomas J. Fratar, Alvin S. Goodman, and Austin E. Brant, Jr. (June WW2:2517)
- "Sand By-Passing Project for Shark River Inlet," W. Mack Angus (Sept WW3:2599)
- "Studies of a Channel Through Padre Island, Texas," E. A. Hansen (Sept WW3:2601)
- "Tetrapods and Other Precast Blocks for Breakwaters," P. Daniels, E. Chapus, and R. Dhaille (Sept WW3:2590)
- "Breakwaters in the Hawaiian Islands," Robert Q. Palmer (June WW2:2507)

HARBORS (Geographical)

- "Design Considerations for California Marinas," James W. Dunham (Nov WW4:69:2658)
- "Sacramento River Deep Water Ship Channel: Functional Planning," Amalio Gomez (Nov WW4:53:2649)

HIGHWAYS AND ROADS (General)

- "Analyzing and Projecting Travel Data," Wilbur S. Smith (June HW2:2513)
- "Correlation of Vehicle Design and Highway Design," Richard A. Haber and David K. Witheford (June HW2:2529)

HIGHWAYS AND ROADS (General) Continued

- "Developing Alternative Urban Transportation Systems," William R. McConochie (Mar HW1:2417)
- "Freeway Spacing in an Urban Freeway System," James M. Peterson (Sept HW3:2596)
- "High Temperature Effects on Bituminous Mixes," William H. Gotoski (Sept HW3:2592)
- "Highway Location and Design by Photogrammetric-Electronic Computer," S. E. Ridge (Feb SU1:2380)
- "Highway Research: Progress Report, Committee on Research, Highway Division," John O. Morton, Chmn. (Mar HW1:2416)
- "Highways and Bridges Surveys: Analytic Geometry in Highway Design and Layout, Progress Report, Committee on Engineering Surveys, Surveying and Mapping Division," Arnold A. Katterhenry, Chmn. (July SU2:1:2548)
- "L T S Design of Continuously Reinforced Concrete Pavement," Benjamin F. McCullough and William B. Ledbetter (Dec HW4:1:2677)
- "Roadbeds on Highways and Airport Runways," Ira B. Mullis (Mar HW1:2412)
- "Traffic Behavior and Freeway Ramp Design," Charles Pinnell and Charles J. Keese (Sept HW3:2596)

HIGHWAYS AND ROADS (Geographical)

WASHINGTON, D.C.

- "Developing Alternative Urban Transportation Systems," William R. McConochie (Mar HW1:2417)

HYDRAULICS

- "Boundary Layer Stimulation in Rectangular Conduits," R. G. Cox and F. L. Bauer (Feb HY2:25:2366)
- "Capacitance Method of Measuring Water Film Thickness," Robert H. Black (June HY6:2524)
- "A Comparison of Stream Velocity Meters," F. Wayne Townsend and F. A. Bust (Apr HY4:11:2438)
- "Conservancy Districts as Flood Control Organizations," Cloyde C. Chambers (Apr HY4:1:2429)
- "Diffusers for Disposal of Sewage in Sea Water," A. M. Rawn, F. R. Bowerman, and Norman H. Brooks (Mar SA2:2411)
- "Diffusion in a Sectionally Homogeneous Estuary," Richard Kent (Mar SA2:2408)
- "Drag and Lift on Spheres with Cylindrical Tubes," Donald F. Young (June HY6:2526)
- "Drag Forces in Velocity Gradient Flow," Frank D. Masch and Walter L. Moore (July HY7:1:2546)
- "Early History of Hydrometry in the United States," Steponas Kolupaila (Jan HY1:1:2335)
- "Effects of Flood Flow on Channel Boundaries," D. A. Parsons (Apr HY4:21:2443)
- "Flood Distribution Problems Below Old River," Frederic M. Chatry (Aug HY8:1:2570)
- "Flood-Frequency Relationships in the Pacific Northwest," George L. Bodhaine (Nov HY9:1:2644)
- "Flow Losses in the Lower Gila River," Lawrence F. Pratt (June HY6:2521)
- "Flume Studies of Flow in Steep, Rough Channels," Dean F. Peterson and P. K. Mohanty (Nov HY9:55:2653)
- "The Fourth Root n-f Diagram," T. Blench (Jan HY1:63:2340)
- "Friction Losses on Lines with Service Connections," David L. Muss (Apr HY4:35:2449)
- "Generalized Distribution Network Head Loss Characteristics," M. B. McPherson (Jan HY1:75:2339)
- "Hood Inlet for Closed Conduit Spillways," Fred W. Blaisdell (May HY5:2478)
- "Hydrologic Studies by Electronic Computers in TVA," Willard M. Snyder (Feb HY2:1:2362)
- "Irrotational Motion of Two Fluid Strata Towards a Line Sink," D. G. Huber (Aug EM4:71:2573)
- "Jet Diffusion in Liquid of Greater Density," G. Abraham (June HY6:2506)
- "Models Primarily Dependent on the Reynolds Number," W. P. Simmons, Jr. (June HY6:2531)
- "New Approach to Local Flood Problems," Herbert D. Vogel (Jan HY1:53:2336)
- "Periodical Gravity Wave on a Discontinuity," Bernard LeMehaute (Nov HY9:11:2646)
- "Physical Characteristics of Drainage Basins," Bernard L. Golding and Dana E. Low (Mar HY3:2409)
- "Predicting Storm Runoff on Small Experimental Watersheds," Neal E. Minshall (Aug HY8:17:2577)
- "Radioactive Tracers in Hydrometeorology," L. Machta (Apr HY4:49:2451)
- "Resistance to Flow in Alluvial Channels," Daryl B. Simons and E. V. Richardson (May HY5:2485)
- "Scales of Viscous Analogy Models for Ground Water Studies," Jacob Bear (Feb HY2:11:2364)
- "Scour at Bridge Crossings," Emmet M. Laursen, (Feb HY2:39:2369)
- "Sedimentation Aspects in Diversion at Old River," Fred B. Toffaletti (June HY6:2525)
- "Sediment Problems of the Lower Colorado River," Whitney M. Borland and Carl R. Miller (Apr HY4:61:2452)
- "Sediment Transport and Delta Formation," E. Kuiper (Feb HY2:55:2371)
- "Strategic Aspects of Urban Flood-Plain Occupation," Gilbert F. White (Feb HY2:89:2376)
- "Studies of a Channel Through Padre Island, Texas," E. A. Hansen (Sept WW3:2601)
- "Tests on Prestressed Concrete Embedded Cylinder Pipe," Hugh F. Kennison (Nov HY9:77:2655)
- "Tolkmit's Backwater and Dropdown Curve Tables," R. D. Goodrich (May HY5:2469)
- "Translations of Foreign Literature on Hydraulics: Second Progress Report, Task Force on List of Translations, Committee on Hydromechanics, Hydraulics Division," Jan C. Van Tienhoven, Chmn. (June HY6:2514)
- "Translations of Foreign Literature on Hydraulics: Third Progress Report, Task Force on List of Translations, Committee on Hydromechanics, Hydraulics Division," Jan C. Van Tienhoven, Chmn. (Nov HY9:99:2656)
- "Trap Efficiency of Reservoirs, Debris Basins, and Debris Dams," Charlie M. Moore, Walter J. Wood, and Graham W. Renfro (Feb HY2:69:2374)
- "Uniform Water Conveyance Channels in Alluvial Material," Daryl B. Simons and Maurice L. Albertson (May HY5:2484)
- "Unsteady Flow of Ground Water into a Surface Reservoir," William Haushild and Gordon Kruse (July HY7:13:2551)
- "Vortex Tube and Sand Trap," A. R. Robinson (Dec IR4:1:2669)
- "Water Eddy Forces on Oscillating Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker (Nov HY9:43:2652)

HYDRODYNAMICS

- "Drag Coefficients of Locomotion over Viscous

HYDRODYNAMICS Continued

- Soils," Ervin Hegedus and Robert S. Rowe (Apr SM2:64:2448)
- "Drag Forces in Velocity Gradient Flow," Frank D. Masch and Walter L. Moore (July HY7:1:2546)
- "Periodical Gravity Wave on a Discontinuity," Bernard Le Mehaute (Nov HY9:11:2646)
- "Water Eddy Forces on Oscillating Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker (Nov HY9:43:2652)

HYDROGRAPHS

- "Predicting Storm Runoff on Small Experimental Watersheds," Neal E. Minshall (Aug HY8:17:2577)
- "Sediment Problems of the Lower Colorado River," Whitney M. Borland and Carl R. Miller (Apr HY4:61:2452)

HYDROLOGY

- "Computer Applications in Groundwater Hydrology," Joseph Foley (Sept IR3:2598)
- "Hydrologic Studies by Electronic Computers in TVA," Willard M. Snyder (Feb HY2:1:2362)
- "Hydrology and Flood Control Features at Oroville Dam," Joseph L. Burns, Kenneth B. Mayo, and William A. Arvola (Nov WW4:33:2648)
- "Los Angeles Water Supply and Irrigation," Samuel B. Morris (Dec IR4:35:2671)

IMPACT

- "Shock Pressures Exerted by Breaking Waves on Breakwaters," Shoshichiro Nagai (June WW2:2504)

IRRIGATION (General)

- "Advisory Committee on Weather Control," Frederic A. Berry (Mar IR1:2400)
- "Climate and Crops in Humid Areas," J. A. Riley and P. H. Grissom (Dec IR4:107:2685)
- "Cloud Seeding Results in Santa Clara County," Arnett S. Dennis (Mar IR1:2399)
- "Computer Applications in Groundwater Hydrology," Joseph Foley (Sept IR3:2598)
- "Drainage, a Vital Need in Irrigated Humid Areas," Albert L. King (Dec IR4:81:2676)
- "Drainage and Water Management Research in Western Europe," William W. Donnan (June IR2:2527)
- "Drawdown Due to Pumping From an Unconfined Aquifer," Robert E. Glover and Morton W. Bittinger (Sep IR3:2594)
- "Evaluation of Seeding Trials," Arnold Court (Mar IR1:2403)
- "Experiments on Treatment of Summer Cumulus Clouds," Louis J. Battan and Richard Kassander, Jr. (Mar IR1:2394)
- "Generator Technology for Cloud Seeding," D. M. Fuquay (Mar IR1:2398)
- "Geophysical Procedures in Ground Water Study," H. R. McDonald and Dart Wantland (Sept IR3:2598)
- "Humid Zone Irrigation in Ceylon," Philip P. Dickinson (Dec IR4:101:2682)
- "Irrigation and Drainage Potentials in Humid Areas," Marion Clifford Boyer (Sept IR3:2593)
- "Irrigation Systems of the Tigris and Euphrates Valleys," Stanley S. Butler (Dec IR4:59:2673)
- "Los Angeles Water Supply and Irrigation," Samuel B. Morris (Dec IR4:35:2671)
- "Method for Estimating Consumptive Use of Water for Agriculture," Wendell C. Munson (Dec IR4:45:2672)
- "Methods of Applying Irrigation Water," Paul H. Berg (Sept IR3:2595)

"Natural Variability of Storm, Seasonal and Annual Precipitation," Glenn E. Stout (Mar IR1:2404)

- "The Nature of Cloud Systems," Horace R. Byers (Mar IR1:2401)
- "Physical Properties of Clouds," Roscoe R. Braham, Jr. (Mar IR1:2402)
- "Physical Studies of Santa Barbara Storms," Theodore B. Smith (Mar IR1:2395)
- "The Santa Barbara Project," Robin R. Reynolds (Mar IR1:2406)
- "Seeding Clouds in Tropical Climates," Wallace E. Howell (Mar IR1:2397)
- "Seeding of West Coast Winter Storms," Robert D. Elliott (Mar IR1:2396)
- "Seepage Losses from Parallel Canal Systems," H. Y. Hammad (Aug EM4:43:2571)
- "Serendipity and the Development of Experimental Meteorology," Vincent J. Schaefer (Mar IR1:2393)
- "Vortex Tube and Sand Trap," A. R. Robinson (Dec IR4:1:2669)
- "A Weather Modification Program for the Future," Howard T. Orville (Mar IR1:2405)
- "World Practices in Water Measurements in Turnouts," Charles W. Thomas (June IR2:2530)

IRRIGATION (Geographical)

CEYLON

- "Humid Zone Irrigation in Ceylon," Philip P. Dickinson (Dec IR4:101:2682)

IRAQ

- "Heritage of Irrigation in Iraq," M. R. Lewis (June IR2:2495)
- "Irrigation Systems of the Tigris and Euphrates Valleys," Stanley S. Butler (Dec IR4:59:2673)

LATIN AMERICA

- "Irrigation and Drainage Problems in Uruguay," J. E. Christiansen (June IR2:2494)
- "Irrigation in Latin America," Lyman S. Willard (Sept IR3:2610)

TAIWAN

- "Development of Rotational Irrigation in Taiwan," Lee Chow (Sept IR3:2588)

JOINTS (General)

- "Commentary on Plastic Design in Steel: Connections: Progress Report, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," (Apr EM2:107:2453)
- "Static Tension Tests of Compact Bolted Joints," Robert T. Foreman and John L. Rumpf (June ST6:2523)

LAKES (Geographical)

GREAT LAKES

- "Early History of Hydrometry in the United States," Steponas Kolupala (Jan HY1:1:2335)

LEVEES

- "Bank Protection on Central Valleys Streams, California," R. W. Barsdale (Nov WW4:1:2642)

LIMIT DESIGN, THEORY OF

- "Capacitance Method of Measuring Water Film Thickness," Robert H. Black (June HY6:2524)
- "Electrical Analog Computer for Limit Design of Structures," M. Zaid and F. L. Ryder (Jan EM1:1:2331)
- "Limit Design of Reinforced Concrete Beams," D. T. Wright and C. Berwanger (July ST7:1:2541)
- "Strength and Efficiency Aspects of Plate Structures," George Gerard (Apr EM2:17:2439)

LOAD

- "Analysis of Load Distribution in the Piles of Piers," M. A. Gouda (June WW2:2534)
- "Deflection Stability of Frames under Repeated Loads," E. P. Popov and R. E. McCarthy (Jan EM1:61:2334)
- "Design of Circular Plates Based on Plastic Limit Load," L. W. Hu (Jan EM1:91:2338)
- "Elastic-Plastic Analysis of Transversely Loaded Plates," John F. Brothie (Oct EM5:2622)
- "Load Distribution in Composite Girder-Slab Systems," G. Hondros and J. G. Marsh (Nov ST11:79:2645)
- "Movements of a Cable Due to Changes in Loading," James Michalos and Charles Birnstiel (Dec ST12:23:2674)
- "Travelling Loads on Rigid-Plastic Beams," P. S. Symonds and B. G. Neal (Jan EM1:79:2337)

LOCKS

- "Dewatering the Port Allen Lock Excavation," Charles I. Mansur and Robert I. Kaufman (Dec SM6:35:2683)
- "Navigation Model Studies of New Ohio River Locks," Eugene P. Fortson, Jr. and George B. Fenwick (June WW2:2518)

MAPS AND MAPPING, AERIAL

- "Topographic Mapping in Alaska," Reynold S. Isto (Feb SU1:2388)

MAPS AND MAPPING (General)

- "The Builder of the Newport (Rhode Island) Tower," Edward Adams Richardson (Feb SU1:2383)
- "Highway Location and Design by Photogrammetric-Electronic Computer," S. E. Ridge (SU1:2380)
- "SDR Survey for Proposed Chesapeake Bay Crossing," Walter C. Beckmann, Charles L. Drake, and George H. Sutton (July SU2:19:2553)
- "Topographic Mapping in Alaska," Reynold S. Isto (Feb SU1:2388)

MAPS AND MAPPING, LAND

- "Prospecting for Thermal Power Plant Sites," R. A. Elliot (Feb PO1:1:2361)

MATERIAL OF CONSTRUCTION

- "Physical Metallurgy and Mechanical Properties of Brittle Fracture," B. L. Averbach (Dec EM6:29:2686)
- "Physical Metallurgy and Mechanical Properties of Materials: Ductility and the Strength of Metallic Structures," J. M. Frankland (Dec EM6:45:2687)
- "Physical Metallurgy and Mechanical Properties of Materials: Fatigue of Structural Materials," Horace J. Grover (Dec EM6:53:2688)
- "Physical Metallurgy and Mechanical Properties of Materials: Metallurgical Advances and Civil Engineering," Glenn Murphy (Dec EM6:65:2689)

MATHEMATICS

- "Anchored Bulkhead Design by Numerical Method," F. E. Richart, Jr. (Feb SM1:29:2373)
- "Asymmetrical Bending of Conical Shells," Bayard Wilson (June EM3:2510)
- "Bearing Capacity of Floating Ice Sheets," G. G. Meyerhof (Oct EM5:2627)
- "Behavior of Viscoelastic Plates in Bending," George E. Mase (June EM3:2498)

- "The Calculating Machine in Coordinate Geometry," Bela Vadasz (Feb SU1:7:2387)
 - "Continuous Girder Bridge with Variable Moment of Inertia," Sabri Sami (Jan ST1:19:2346)
 - "Corrected Deflection Theory of Suspension Bridges," John Szidarovsky (Nov ST11:1:2638)
 - "Derivation of Flow Equations for Sewage Sludges," Vaughn C. Behn (Nov SA6:59:2663)
 - "Elastic-Plastic Analysis of Transversely Loaded Plates," John F. Brothie (Oct EM5:2622)
 - "Elasto-Plastic Analysis by Numerical Procedures," Annabel L. Tong (Dec EM6:73:2690)
 - "Highway and Bridge Surveys: Analytic Geometry in Highway Design and Layout: Progress Report, Committee on Engineering Surveys, Surveying and Mapping Division," Arnold A. Katterhenry, Chmn. (July SU2:1:2548)
 - "Intersection of Straight Line with Spiral," T. F. Hickerson (Feb SU1:2379)
 - "Irrational Motion of Two Fluid Strata Towards a Line Sink," D. G. Huber (Aug EM4:71:2573)
 - "Matrix Analysis of Plane Rigid Frames," Fernando Venancio Filho (July ST7:95:2547)
 - "Matrix Formulation of the Folded Plate Equations," A. C. Scordelis (Oct ST10:2617)
 - "Method for Analysis of Multibeam Bridges," John E. Duberg, Narbey Khachatryan, and Raul E. Fradinger (July ST7:109:2552)
 - "Orthogonal Gridworks Loaded Normally to their Planes," Ignacio Martin and José Hernandez (Jan ST1:1:2344)
 - "Periodical Gravity Wave on a Discontinuity," Bernard Le Mehaute (Nov HY9:11:2646)
 - "Pile-Driving Analysis by the Wave Equation," E. A. L. Smith (Aug SM4:35:2574)
 - "Some Basic Concepts in Matrix Structural Analysis," Frank R. Berman (Aug ST8:59:2582)
 - "Stress Conditions in Triaxial Compression," A. Balla (Dec SM6:57:2684)
 - "Stresses in Layered Elastic Solids," M. M. Lemcoe (Aug EM4:1:2565)
 - "Torsional Analysis of Suspension Bridge Towers," Frank Baron and Anthony G. Arioto, (Jan ST1:143:2354)
 - "Vibrations and Stability of Plates Under Initial Stress," George Herrmann and Anthony E. Armenakas (June EM3:2500)
 - "Waves and Shocks in Locking and Dissipative Media," Mario G. Salvadori, Richard Skalak, and Paul Weidinger (Apr EM2:77:2447)
 - "Wind Stresses in Domes," P. Gondikas and M. G. Salvadori (Oct EM5:2616)
- METEOROLOGY**
- "Advisory Committee on Weather Control," Frederic A. Berry (Mar IR1:2400)
 - "Cloud-Seeding Results in Santa Clara County," Arnett S. Dennis (Mar IR1:2399)
 - "Evaluation of Seeding Trials," Arnold Court (Mar IR1:2403)
 - "Experiments on Treatment of Summer Cumulus Clouds," Louis J. Battan and Richard Kassander, Jr. (Mar IR1:2394)
 - "Generator Technology for Cloud Seeding," D. M. Fuquay (Mar IR1:2398)
 - "Natural Variability of Storm, Seasonal and Annual Precipitation," Glenn E. Stout (Mar IR1:2404)
 - "The Nature of Cloud Systems," Horace R. Byers (Mar IR1:2401)
 - "Physical Properties of Clouds," Roscoe R. Braham, Jr. (Mar IR1:2402)

METEOROLOGY Continued

- "Physical Studies of Santa Barbara Storms," Thomas B. Smith (Mar IR1:2345)
- "Radioactive Tracers in Hydrometeorology," L. Machta (Apr HY4:49:2451)
- "The Santa Barbara Project," Robin R. Reynolds (Mar IR1:2406)
- "Seeding Clouds in Tropical Climates," Wallace E. Howell (Mar IR1:2397)
- "Seeding of West Coast Winter Storms," Robert D. Elliott (Mar IR1:2396)
- "Serendipity and the Development of Experimental Meteorology," Vincent J. Schaefer (Mar IR1:2393)
- "A Weather Modification Program for the Future," Howard T. Orville (Mar IR1:2405)

METERS AND METERING

- "Automatic System for Monitoring Water Quality, Twenty-Eighth Progress Report, Committee on Research, Sanitary Engineering Division," N. L. Nemerow, Chmn. (July SA4:25:2554)
- "Capacitance Method of Measuring Water Film Thickness," Robert H. Black (June HY6:2524)
- "A Comparison of Stream Velocity Meters," F. Wayne Townsend and F. A. Bust (Apr HY4:11:2438)
- "Early History of Hydrometry in the United States," Steponas Kolupaila (Jan HY1:1:2335)
- "Southwest Pass-Mississippi River 40-ft Channel," Austin B. Smith (Sept WW3:2606)
- "World Practices in Water Measurements in Turnouts," Charles W. Thomas (June IR2:2530)

MODELS (General)

- "Electric Analog for Triangulation Adjustment," Hsuan-Loh Su (Feb SU1:43:2370)
- "Relaxation Theory of Creep of Metals," Francis H. Ree, Taikyue Ree, and Henry Eyring (Jan EM1:41:2333)

MODELS, HYDRAULIC

- "Breakwaters in the Hawaiian Islands," Robert Q. Palmer (June WW2:2507)
- "Diffusion in a Sectionally Homogeneous Estuary," Richard Kent (Mar SA2:2408)
- "Drag and Lift on Spheres with Cylindrical Tubes," Donald F. Young (June HY6:2526)
- "Drag Forces in Velocity Gradient Flow," Frank D. Masch and Walter L. Moore (July HY7:1:2546)
- "Jet Diffusion in Liquid of Greater Density," G. Abraham (June HY6:2506)
- "Models Primarily Dependent on the Reynolds Number," W. P. Simmons, Jr. (June HY6:2531)
- "Navigation Model Studies of New Ohio River Locks," Eugene P. Fortson, Jr. and George B. Fenwick (June WW2:2518)
- "Pneumatic Barrier Against Salt Water Intrusion," Ian Larsen (Sep WW3:2600)
- "Resistance to Flow in Alluvial Channels," Daryl B. Simons and E. V. Richardson (May HY5:2485)
- "Scales of Viscous Analogy Models for Ground Water Studies," Jacob Bear (Feb HY2:11:2364)
- "Waves in Navigation Canals Due to Lock Filling," Hans-Werner Partenscky (Mar WW1:2422)

MODELS, STRUCTURAL

- "Arch Dam Analysis with an Electric Analog Computer," Richard H. MacNeal (Aug EM4:127:2578)
- "Design of Karadj Hydroelectric Project," Richard D. Harza and Robert F. Edbrooke (Aug PO4:31:2579)

- "Elastic Model Design of the B-58 Airplane," J. W. Wells and H. B. England (Aug EM4:153:2580)
- "Electrical Energy Analogs of Vibrating Beams," Frederick L. Ryder (Oct EM5:2620)
- "Experimental Study of Beams on Elastic Foundations," Robert L. Thoms (June EM3:2505)
- "Geometry of Moire Fringes in Strain Analysis," Stanley Morse, August J. Durelli, and Cesar A. Scimmarella (Aug EM4:105:2576)
- "Italian Arch Dam Design and Model Confirmation," Guido Oberti (Mar ST3:2410)
- "Load Distribution in Composite Girder-Slab Systems," G. Hondros and J. G. Marsh (Nov ST11:79:2645)
- "Reinforced Concrete Shear Wall Assemblies," Jack R. Benjamin and Harry A. Williams (Aug ST8:1:2566)
- "Stability Problems of Compressed Steel Members and Arch Bridges," George Wastlund (June ST6:2512)
- "Structural Model Analysis by Means of Moire Fringes," A. J. Durelli and I. M. Daniel (Dec ST12:93:2693)
- "White Noise Representation of Earthquakes," G. N. Bycroft (Apr EM2:1:2434)

MOMENTS

- "Analysis of Frames with Nonlinear Behavior," Alfredo Hua-Sing Ang (June EM3:2479)
- "Use of Continuity-Factor and Final Position," Yon-Sun Chou (Nov ST11:1:2637)

NOMOGRAPHS

- "Distribution of Extreme Winds in the United States," H. C. S. Thom (Apr ST4:11:2433)
- "Flood-Frequency Relationships in the Pacific Northwest," George L. Bodhaine (Nov HY9:1:2644)
- "Lateral Buckling of Beams," J. W. Clark and H. N. Hill (July ST7:175:2559)
- "Method for Estimating Consumptive Use of Water for Agriculture," Wendell C. Munson (Dec IR4:45:2672)

OXYGENATION

- "Low Pressure Aeration of Water and Sewage," N. Claes H. Fischerstrom (Sep SA5:2607)

PAVEMENT AND PAVING, BITUMINOUS

- "Reinforced Concrete Pavements for Airports," August W. Compton (May AT1:2460)

PAVEMENT AND PAVING, CONCRETE

- "Epoxy Asphalt Concrete for Airfield Pavements," W. C. Simpson, H. J. Sommer, R. L. Griffin, and T. K. Miles (May AT1:2466)
- "Epoxy Resin for Structural Repair of Concrete Pavement," Wilson L. Davis and Eugene Pinkstaff (Feb ST2:2360)
- "L T S Design of Continuously Reinforced Concrete Pavement," Benjamin F. McCullough and William B. Ledbetter (Dec HW4:1:2677)

PILES AND PILE DRIVING

- "Analysis of Load Distribution in the Piles of Piers," M. A. Gouda (June WW2:2534)
- "Concrete Addition to Cellular Sheet Pile Shipway," John W. Irvine and Richard F. Gaston (May CO2:2493)
- "Experience with a Pier-Supported Building over Permafrost," H. B. Dickens and C. M. Gray (Oct SM5:2618)

PILES AND PILE DRIVING Continued

- "Generalized Solutions for Laterally Loaded Piles," Hudson Matlock and Lymon C. Reese (Oct SM5:2626)
- "Pile-Driving Analysis by the Wave Equation," E. A. L. Smith (August SM4:35:2574)
- "Pile Driving Experiences at Port Everglades," T. J. Lynch (Apr SM2:41:2442)

PIPELINES

- "Friction Losses on Lines with Service Connections," David L. Muss (Apr HY4:35:2449)
- "Methods of Applying Irrigation Water," Paul H. Berg (Sept IR3:2595)

PIPES AND PIPING

- "Boundary Layer Stimulation in Rectangular Conduits," R. G. Cox and F. L. Bauer (Feb HY2:25:2366)
- "Generalized Distribution Network Head Loss Characteristics," M. B. McPherson (Jan HY1:75:2339)
- "High Temperature Effects on Bituminous Mixes," William H. Gotsolki (Sept HW3:2592)
- "Tests on Prestressed Concrete Embedded Cylinder Pipe," Hugh F. Kennison (Nov HY9:77:2655)

PLASTICITY

- "Commentary on Plastic Design in Steel: Compression Members: Progress Report No. 5, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (Jan EM1:117:2342)
- "Commentary on Plastic Design in Steel: Connections: Progress Report, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (Apr EM2:107:2453)
- "Commentary on Plastic Design in Steel: Deflections: Progress Report, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (April EM2:141:2454)
- "Deflection Stability of Frames under Repeated Loads," E. P. Popov and R. E. McCarthy (Jan EM1:61:2334)
- "Design of Circular Plates Based on Plastic Limit Load," L. W. Hu (Jan EM1:91:2338)
- "Dynamic Analysis of Elasto-Plastic Structures," Glen V. Berg and Donald A. DaDeppo (Apr EM2:35:2440)
- "Elastic-Plastic Analysis of Transversely Loaded Plates," John F. Brothchie (Oct EM5:2622)
- "Elasto-Plastic Analysis by Numerical Procedures," Annabel L. Tong (Dec EM6:73:2690)
- "Limit Design of Reinforced Concrete Beams," D. T. Wright and C. Berwanger (July ST7:1:2541)
- "Mechanics of the Triaxial Test for Soils," R. M. Haythornthwaite (Oct SM5:2625)
- "New Aspects Concerning Inelastic Instability of Steel Structures," Bruno Thurlimann (Jan ST1:99:2351)
- "Physical Metallurgy and Mechanical Properties of Materials: Ductility and the Strength of Metallic Structures," J. M. Frankland (Dec EM6:45:2687)
- "Plastic Analysis of Shallow Conical Shells," E. T. Onat (Dec EM6:1:2675)
- "Principle of Virtual Work in Structural Analysis," Frank DiMaggio (Nov ST11:65:2643)
- "Travelling Loads on Rigid-Plastic Beams," P. S. Symonds and B. G. Neal (Jan EM1:79:2337)
- "Various Instability Modes of the Fixed Base Column," D. A. Sawyer (July ST7:61:2554)

- "Waves and Shocks in Locking and Dissipative Media," Mario G. Salvadori, Richard Skalak, and Paul Weidinger (Apr EM2:77:2447)

PLATES

- "Behavior of Buckled Rectangular Plates," Manuel Stein (Apr EM2:59:2445)
- "Behavior of Viscoelastic Plates in Bending," George E. Mase (June EM3:2498)
- "Bending of Plates on a Viscoelastic Foundation," K. S. Pister and M. L. Williams (Oct EM5:2619)
- "Design of Circular Plates Based on Plastic Limit Load," L. W. Hu (Jan EM1:91:2338)
- "Elastic-Plastic Analysis of Transversely Loaded Plates," John F. Brothchie (Oct EM5:2622)
- "Long Span Prestressed Concrete Folded Plate Roofs," John C. Brough, Jr. and B. H. Stephens, Jr. (Oct ST10:2630)
- "Matrix Formulation of the Folded Plate Equations," A. C. Scordelis (Oct ST10:2617)
- "Plastic Analysis of Shallow Conical Shells," E. T. Onat (Dec EM6:1:2675)
- "Simply Supported Corner Plate," Mario G. Salvadori and H. G. Reggini (Nov ST11:141:2654)
- "Strength and Efficiency Aspects of Plate Structures," George Gerard (Apr EM2:17:2439)
- "Vibrations and Stability of Plates Under Initial Stress," George Herrmann and Anthony E. Armenakas (June EM3:2500)

POLLUTION, AIR

- "Man Versus Environment: Twenty-Seventh Progress Report, Committee on Research, Sanitary Engineering Division," N. L. Nemerow, Chmn. (July SA4:13:2549)

POLLUTION, STREAM

- "Aerobic Metabolism of Potassium Cyanide," John B. Nesbitt, H. Robert Kohl, and Elmer L. Wagner, Jr. (Jan SA1:1:2341)
- "Diffusion in a Sectionally Homogeneous Estuary," Richard Kent (Mar SA2:2408)
- "Oxygen Balance of an Estuary," Donald J. O'Connor (May SA3:2472)

POPULATION

- "Irrigation and Drainage Potentials in Humid Areas," Marion Clifford Boyer (Sept IR3:2593)

POWER (General)

- "Additional Aspects of the Enrico Fermi Atomic Power Plant," N. L. Scott and R. F. Mantey (Feb PO1:39:2375)
- "Arch Dam Analysis with an Electric Analog Computer," Richard H. MacNeal (Aug EM4:127:2578)
- "Containment Studies for an Atomic Power Plant," William McGuire and Gordon P. Fisher (June PO3:2508)
- "Control of Cracking in TVA Concrete Gravity Dams," Walter F. Emmons, Olav Lavik, and Poul L. Hornby (Feb PO1:11:2372)
- "Cooling Water for Steam Electric Stations on Tidewater," R. W. Spenser and John Bruce (June PO3:2503)
- "Design of Arch Dams by Trial Load Method of Analysis," Merlin D. Copen (Aug PO4:13:2569)
- "Design of Karadj Hydroelectric Project," Richard D. Harza and Robert F. Edbrooke (Aug PO4:31:2579)
- "Digital Computers for Trial-Load Analysis of Arch Dams," L. R. Scrivner (Aug PO4:1:2568)

POWER (General) Continued

- "Furnas Hydroelectric Project," James W. Libby (Apr PO2:1:2430)
- "Hydroelectric Possibilities and Influence of Load Growth," S. P. McCasland (Apr PO2:29:2435)
- "Piratinanga Steam-Electric Generating Station," O. L. Hooper and H. M. Estes (Apr PO2:17:2432)
- "Prospecting for Thermal Power Plant Sites," R. A. Elliot (Feb PO1:1:2361)
- "Regla Steam Electric Station," George T. Ingalls (June PO3:2520)

POWER (Geographical)

BRAZIL

- "Furnas Hydroelectric Project," James W. Libby (Apr PO2:1:2430)
- "Piratinanga Steam-Electric Generating Station," O. L. Hooper and H. M. Estes (Apr PO2:17:2432)

CALIFORNIA

- "Cooling Water for Steam Electric Stations on Tidewater," R. W. Spencer and John Bruce (June PO3:2503)

WASHINGTON

- "Construction of Rocky Reach Hydroelectric Project," W. N. Evans and J. H. Boyd (Nov CO3:45:2662)

POWER PLANTS (General)

- "Additional Aspects of the Enrico Fermi Atomic Power Plant," N. L. Scott and R. F. Mantey (Feb PO1:39:2375)
- "Cooling Water for Steam Electric Stations on Tidewater," R. W. Spencer and John Bruce (June PO3:2503)
- "Hydroelectric Possibilities and Influence of Load Growth," S. P. McCasland (Apr PO2:29:2435)
- "Prospecting for Thermal Power Plant Sites," R. A. Elliott (Feb PO1:1:2361)
- "Structural Engineering Aspects of Nuclear Power Plants," Lewis L. T. Au and Edward Y. W. Tsui (June ST6:2509)

POWER PLANTS (Geographical)

BRAZIL

- "Furnas Hydroelectric Project," James W. Libby (Apr PO2:1:2430)
- "Piratinanga Steam-Electric Generating Station," O. L. Hooper and H. M. Estes (Apr PO2:17:2432)

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- "Regla Steam Electric Station," George T. Ingalls (June PO3:2520)

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- "Design of Karadj Hydroelectric Project," Richard D. Harza and Robert F. Edbrooke (Aug PO4:31:2579)

MICHIGAN

- "Additional Aspects of the Enrico Fermi Atomic Power Plant," N. L. Scott and R. F. Mantey (Feb PO1:39:2375)

TENNESSEE VALLEY

- "Prospecting for Thermal Power Plant Sites," R. A. Elliot (Feb PO1:1:2361)

PROBABILITY, THEORY OF

- "Containment Studies for an Atomic Power Plant," William McGulre and Gordon P. Fisher (June PO3:2508)

PUBLIC HEALTH

- "Aerobic Metabolism of Potassium Cyanide," John B. Nesbitt, H. Robert Kohl, and Elmer L. Wagner, Jr. (Jan SA1:1:2341)
- "Man Versus Environment: Twenty-Seventh Progress Report, Committee on Research, Sanitary Engineering," N. L. Nemerow, Chmn. (July SA4:13:2549)
- "Russian Water Supply and Treatment Practices," V. J. Calise and W. A. Homer (Mar SA2:2407)
- "Sanitary Engineering Aspects of Nuclear Energy: Progress Report, Committee on the Sanitary Engineering Aspects of Nuclear Energy, Sanitary Engineering Division," (May SA3:2476)
- "Tritium as a Ground Water Tracer," W. J. Kaufman (Nov SA6:47:2660)

PUMPS AND PUMPING

- "Drawdown Due to Pumping From an Unconfined Aquifer," Robert E. Glover and Morton W. Bittinger (Sept IR3:2594)

RAILROADS

- "Soil Freezing to Reconstruct a Railway Tunnel," George J. Low (Nov CO3:1:2639)

RAINFALL (General)

- "Advisory Committee on Weather Control," Frederic A. Berry (Mar IR1:2400)
- "Climate and Crops in Humid Areas," J. A. Riley and P. H. Grissom (Dec IR4:107:2685)
- "Cloud-Seeding Results in Santa Clara County," Arnett S. Dennis (Mar IR1:2399)
- "Drainage, a Vital Need in Irrigated Humid Areas," Albert L. King (Dec IR4:81:2676)
- "Evaluation of Seeding Trials," Arnold Court (Mar IR1:2403)
- "Experiments on Treatment of Summer Cumulus Clouds," Louis J. Battan and Richard Kassander, Jr. (Mar IR1:2394)
- "Generator Technology for Cloud Seeding," D. M. Fuquay (Mar IR1:2398)
- "Natural Variability of Storm, Seasonal and Annual Precipitation," Glenn E. Stout (Mar IR1:2404)
- "The Nature of Cloud Systems," Horace R. Byers (Mar IR1:2401)
- "Physical Properties of Clouds," Roscoe R. Braham, Jr. (Mar IR1:2402)
- "Physical Studies of Santa Barbara Storms," Theodore B. Smith (Mar IR1:2395)
- "The Santa Barbara Project," Robin R. Reynolds (Mar IR1:2406)
- "Seeding Clouds in Tropical Climates," Wallace E. Howell (Mar IR1:2397)
- "Seeding of West Coast Winter Storms," Robert D. Elliott (Mar IR1:2396)
- "Serendipity and the Development of Experimental Meteorology," Vincent J. Schaefer (Mar IR1:2393)
- "A Weather Modification Program for the Future," Howard T. Orville (Mar IR1:2405)

RAINFALL (Geographical)

CEYLON

- "Humid Zone Irrigation in Ceylon," Philip P. Dickinson (Dec IR4:101:2682)

IRAQ

- "Heritage of Irrigation in Iraq," M. R. Lewis (June IR2:2495)

LATIN AMERICA

- "Irrigation in Latin America," Lyman S. Willardson (Sept IR3:2610)

RAINFALL (Geographical) Continued

SANTA BARBARA, CALIF.

"Physical Studies of Santa Barbara Storms," Theodore B. Smith (Mar IR1:2395)

URUGUAY

"Irrigation and Drainage Problems in Uruguay," J. E. Christiansen (June IR2:2494)

REPORTS OF COMMITTEES

"Automatic System for Monitoring Water Quality, Twenty-Eighth Progress Report, Committee on Research, Sanitary Engineering," N. L. Nemerow, Chmn. (July SA4:25:2554)

"Commentary on Plastic Design in Steel: Compression Members: Progress Report No. 5, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (Jan EM1:117:2342)

"Commentary on Plastic Design in Steel: Connections: Progress Report, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (Apr EM2:107:2453)

"Commentary on Plastic Design in Steel: Deflections: Progress Report, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (Apr EM2:141:2454)

"Field Office Bookshelf: Progress Report, Committee on Publications, Construction Division," Morton D. Morris, Chmn. (Feb ST2:2357)

"Highway and Bridge Surveys: Analytic Geometry in Highway Design and Layout: Progress Report, Committee on Engineering Survey, Surveying and Mapping Division," Arnold A. Katterhenry, Chmn. (July SU2:1:2548)

"Man Versus Environment: Twenty-Seventh Progress Report, Committee on Research, Sanitary Engineering Division," N. L. Nemerow, Chmn. (July SA4:13:2549)

"Sanitary Engineering Aspects of Nuclear Energy: Progress Report, Committee on the Sanitary Engineering Aspects of Nuclear Energy, Sanitary Engineering Division," (May SA3:2476)

"Solubility of Atmospheric Oxygen in Water: Twenty-Ninth Progress Report, Committee on Research, Sanitary Engineering Division," N. L. Nemerow, Chmn. (July SA4:41:2558)

"Tentative Recommendations for the Design and Construction of Composite Beams and Girders for Buildings: Progress Report, Joint ASCE-ACI Committee on Composite Construction," Philip P. Page, Chmn. (Dec ST12:73:2692)

"Translations of Foreign Literature on Hydraulics: Second Progress Report, Task Force on List of Translations, Committee on Hydromechanics, Hydraulics Division (June HY6:2514)

"Translations of Foreign Literature on Hydraulics: Third Progress Report, Task Force on List of Translations Committee on Hydromechanics, Hydraulics Division," Jan C. Van Tienhoven, Chmn. (Nov HY9:99:2656)

RESEARCH

"Drainage and Water Management Research in Western Europe," William W. Donnan (June IR2:2527)

"Highway Research: Progress Report, Committee on Research, Highway Division," John O. Morton, Chmn. (Mar HW1:2416)

"The Impact of Computer on Engineering Education," Gordon P. Fisher (April ST4:1:2428)

"Research on Fire Resistance of Prestressed Concrete," Hubert Woods (Nov ST11:53:2640)

"Review of Research on Composite Steel-Concrete Beams," Ivan M. Viest (June ST6:2496)

"Solubility of Atmospheric Oxygen in Water: Twenty-Ninth Progress Report, Committee on Research, Sanitary Engineering Division," N. L. Nemerow, Chmn. (July SA4:41:2558)

"Summary of the Activities of the Column Research Council," Bruce G. Johnston (Jan ST1:13:2345)

RESERVOIRS (General)

"Sedimentation in Reservoirs in the Southeast," John E. Jenkins, Charles E. Moak, and Daniel A. Okun (July SA4:55:2556)

"Surveys at Cougar Reservoirs," Charles N. Oros (July SU2:13:2550)

"Trap Efficiency of Reservoirs, Debris Basins, and Debris Dams," Charlie M. Moore, Walter J. Wood, and Graham W. Renfro (Feb HY2:69:2374)

RESERVOIRS, WATER STORAGE

"Sedimentation in Reservoirs in the Southeast," John E. Jenkins, Charles E. Moak, and Daniel A. Okun (July SA4:55:2556)

"Unsteady Flow of Ground Water into a Surface Reservoir," William Haushild and Gordon Kruse (July HY7:13:2551)

RIVERS (General)

"Early History of Hydrometry in the United States," Steponas Kolupalla (Jan HY1:1:2335)

RIVERS (Geographical)

ARIZONA

"Flow Losses in the Lower Gila River," Lawrence F. Pratt (June HY6:2521)

ARKANSAS RIVER

"Arkansas River Plan," William Whipple (Sept WW3:2597)

COLORADO RIVER

"Sediment Problems of the Lower Colorado River," Whitney M. Borland and Carl R. Miller (Apr HY4:61:2452)

"Flood Distribution Problems Below Old River," Frederic M. Chatry (Aug HY8:1:2570)

LOUISIANA

"Sedimentation Aspects in Diversion at Old River," Fred B. Toffaleti (June HY6:2525)

MISSISSIPPI RIVER

"Early History of Hydrometry in the United States," Steponas Kolupalla (Jan HY1:1:2335)

"Southwest Pass — Mississippi River 40-ft Channel," Austin B. Smith (Sep WW3:2606)

OHIO RIVER

"Early History of Hydrometry in the United States," Steponas Kolupalla (Jan HY1:1:2335)

"Navigation Model Studies of New Ohio River Locks," Eugene P. Fortson, Jr. and George B. Fenwick (June WW2:2518)

OLD RIVER

"Plan for Closure of Old River," George M. Cookson (Sept WW3:2602)

RUSSIAN RIVER

"Russian River Channel Works," Israel H. Steinberg (Nov WW4:17:2647)

SACRAMENTO RIVER

"Sacramento River Deep Water Ship Channel: Functional Planning," Amalio Gomez (Nov WW4:53:2649)

SASKATCHEWAN RIVER

"Sediment Transport and Delta Formation," E. Kulper (Feb HY2:55:2371)

RUNOFF (General)

- "Hydrologic Studies by Electronic Computers in TVA," Willard M. Snyder (Feb HY2:1:2362)

RUNOFF (Geographical)

PACIFIC NORTHWEST

- "Flood-Frequency Relationships in the Pacific Northwest," George L. Bodhaine (Nov HY9:1:2466)

TENNESSEE VALLEY

- "Hydrologic Studies by Electronic Computers in TVA," Willard M. Snyder (Feb HY2:1:2362)

SAND

- "Sand By-Passing Project for Shark River Inlet," W. Mack Angus (Sept WW3:2599)
- "Tuttle Creek Dam of Rolled Shale and Dredged Sand," K. S. Lane and R. G. Fehrman (Dec SM6:11:2670)
- "Vortex Tube and Sand Trap," A. R. Robinson (Dec IR4:1:2669)

SANITARY ENGINEERING

- "Accident Preparedness in Reactor Waste Treatment," E. D. Harward (July SA4:1:2543)
- "Activated Carbon Removal of Hydrogen Sulfide," R. S. Murphy and I. W. Santry, Jr. (Nov SA6:1:2641)
- "Aerobic Metabolism of Potassium Cyanide," John B. Nesbitt, H. Robert Kohl, and Elmer L. Wagner, Jr. (Jan SA1:1:2341)
- "Automatic System for Monitoring Water Quality, Twenty-Eighth Progress Report, Committee on Research, Sanitary Engineering Division," N. L. Nemerow, Chmn. (July SA4:25:2554)
- "Behavior of Suspensions," A. W. Bond (May SA3:2474)
- "Derivation of Flow Equations for Sewage Sludges," Vaughn C. Behn (Nov SA6:59:2663)
- "Design and Cost Considerations in High Rate Sludge Digestion," Alfred A. Estrada (May SA3:2479)
- "Design Principles for Underground Salt Cavities," Shosel Serata and Earnest Gloyna (May SA3:2468)
- "Diffusers for Disposal of Sewage in Sea Water," A. M. Rawn, F. R. Bowerman, and Norman H. Brooks (Mar SA2:2411)
- "Diffusion in a Sectionally Homogeneous Estuary," Richard Kent (Mar SA2:2408)
- "Fundamental Considerations in High-Rate Digestion," Clair N. Sawyer and Jay S. Grumbling (Mar SA2:2411)
- "Investigation of the Corrosive Behavior of Waters," Werner Stumm (Nov SA6:27:2657)
- "Light Conversion Efficiency of Algae Grown in Sewage," William J. Oswald (July SA4:71:2557)
- "Low Pressure Aeration of Water and Sewage," N. Claes H. Fischerstrom (Sept SA5:2607)
- "Man Versus Environment: Twenty-Seventh Progress Report, Committee on Research, Sanitary Engineering Division," N. L. Nemerow, Chmn. (July SA4:13:2549)
- "Oxygen Balance of an Estuary," Donald J. O'Connor (May SA3:2472)
- "Regional Planning in Cuyahoga County," Alfred A. Estrada (May SA3:2471)
- "Role of Price in the Allocation of Water Sources," Lawrence G. Hines (Jan SA1:1:2341)
- "Russian Water Supply and Treatment Practices," V. J. Calise and W. A. Homer (Mar SA2:2407)
- "Sanitary Engineering Aspects of Nuclear Energy: Progress Report, Committee on the Sanitary Engineering Aspects of Nuclear Energy, Sanitary Engineering Division," (May SA3:2476)
- "Sedimentation in Reservoirs in the Southeast," John E. Jenkins, Charles E. Moak, and Daniel A. Okun (July SA4:55:2556)
- "Solubility of Atmospheric Oxygen in Water: Twenty-Ninth Progress Report, Committee on Research, Sanitary Engineering Division," N. L. Nemerow, Chmn. (July SA4:41:2556)
- "Tritium as a Ground Water Tracer," W. J. Kaufman (Nov SA6:47:2660)
- "Use of Algae in Removing Phosphorus From Sewage," R. H. Bogan, O. E. Albertson, and J. C. Pluntze (Sept SA5:2605)
- "Waste Treatment at the Shippingport Reactor," J. R. LaPointe, W. J. Hahn, and E. D. Harward, Jr. (May SA3:2481)

Sanitary Engineering Aspects of Nuclear Energy, Sanitary Engineering Division, (May SA3:2476)

- "Sedimentation in Reservoirs in the Southeast," John E. Jenkins, Charles E. Moak, and Daniel A. Okun (July SA4:55:2556)

- "Solubility of Atmospheric Oxygen in Water: Twenty-Ninth Progress Report, Committee on Research, Sanitary Engineering Division," N. L. Nemerow, Chmn. (July SA4:41:2556)

- "Tritium as a Ground Water Tracer," W. J. Kaufman (Nov SA6:47:2660)

- "Use of Algae in Removing Phosphorus From Sewage," R. H. Bogan, O. E. Albertson, and J. C. Pluntze (Sept SA5:2605)

- "Waste Treatment at the Shippingport Reactor," J. R. LaPointe, W. J. Hahn, and E. D. Harward, Jr. (May SA3:2481)

SEDIMENT AND SEDIMENTATION

- "Arkansas River Plan," William Whipple (Sept WW3:2597)
- "Behavior of Suspensions," A. W. Bond (May SA3:2474)
- "Design of Inlets for Texas Coastal Fisheries," H. P. Carothers and Homer C. Innis (Sept WW3:2603)
- "Resistance to Flow in Alluvial Channels," Daryl B. Simons and E. V. Richardson (May HY5:2465)
- "Sedimentation Aspects in Diversion at Old River," Fred B. Toffaletti (June HY6:2525)
- "Sedimentation in Reservoirs in the Southeast," John E. Jenkins, Charles E. Moak, and Daniel A. Okun (July SA4:55:2556)
- "Sediment Problems of the Lower Colorado River," Whitney M. Borland and Carl R. Miller (Apr HY4:61:2452)
- "Sediment Transport and Delta Formation," E. Kuiper (Feb HY2:55:2371)
- "Uniform Water Conveyance Channels in Alluvial Material," Daryl B. Simons and Maurice L. Albertson (May HY5:2484)
- "Vortex Tube and Sand Trap," A. R. Robinson (Dec IR4:1:2669)

SEEPAGE

- "Seepage Losses from Parallel Canal Systems," H. Y. Hamad (Aug EM4:43:2571)
- "Seepage Requirements of Filters and Pervious Bases," Harry R. Cedergren (Oct SM5:2623)

SEWAGE DISPOSAL (General)

- "Aerobic Metabolism of Potassium Cyanide," John B. Nesbitt, H. Robert Kohl, and Elmer L. Wagner, Jr. (Jan SA1:1:2341)
- "Design and Cost Considerations in High Rate Sludge Digestion," Alfred A. Estrada (May SA3:2479)
- "Diffusers for Disposal of Sewage in Sea Water," A. M. Rawn, F. R. Bowerman, and Norman H. Brooks (Mar SA2:2411)
- "Jet Diffusion in Liquid of Greater Density," G. Abraham (June HY6:2506)
- "Light Conversion Efficiency of Algae Grown in Sewage," William J. Oswald (July SA4:71:2557)
- "Low Pressure Aeration of Water and Sewage," N. Claes H. Fischerstrom (Sept SA5:2607)
- "Oxygen Balance of an Estuary," Donald J. O'Connor (May SA3:2472)
- "Use of Algae in Removing Phosphorus From Sewage," R. H. Bogan, O. E. Albertson, and J. C. Pluntze (Sept SA5:2605)
- "Waste Treatment at the Shippingport Reactor," J. R. LaPointe, W. J. Hahn, and E. D. Harward, Jr. (May SA3:2481)

SEWAGE SLUDGE

- "Behavior of Suspensions," A. W. Bond (May SA3:2474)
- "Fundamental Considerations in High-Rate Digestion," Clair N. Sawyer and Jay S. Grumbling (Mar SA2:2411)
- "Test of a Riveted Plate Girder with a Thin Web," Desi D. Vasarhelyi, Jim C. Taylor, Naresh C. Vasishth, and Chia-Yao Yuan (Oct ST10:2621)

SEWERS (Geographical)

- LOS ANGELES, CALIF.
 - "Diffusers for Disposal of Sewage in Sea Water," A. M. Rawn, F. R. Bowerman, and Norman H. Brooks (Mar SA2:2411)
- OHIO
 - "Regional Planning in Cuyahoga County, Ohio," Alfred A. Estrada (May SA3:2471)

SHEAR

- "Periods of Framed Buildings for Earthquake Analysis," Mario G. Salvadori and Ewald Heer (Dec ST12:2680)
- "Reinforced Concrete Shear Wall Assemblies," Jack R. Benjamin and Harry A. Williams (Aug ST8:1:2566)
- "Relaxation Theory of Creep of Metals," Francis H. Ree, Taikyue Ree, and Henry Eyring (Jan EM1:41:2333)
- "Review of Research on Composite Steel-Concrete Beams," Ivan M. Viest (June ST6:2496)
- "Shear Diaphragms of Light Gauge Steel," Arthur H. Nilson (Nov ST11:111:2650)
- "Soil Structure and the Step-Strain Phenomenon," D. H. Trollope and C. K. Chan (April SM2:1:2431)
- "Static Tension Tests of Compact Bolted Joints," Robert T. Foreman and John L. Rumpf (June ST6:2523)

SHELL STRUCTURES

- "Asymmetrical Bending of Conical Shells," Bayard Wilson (June EM3:2510)
- "Membrane Stresses in Hyperboloid Shells of Revolution," Placido Cicala (Oct EM5:2628)
- "Plastic Analysis of Shallow Conical Shells," E. T. Onat (Dec EM6:1:2675)
- "The Shell Vault of the Exposition Palace, Paris," Nicolas Esquillan (Jan ST1:41:2347)

SHORES AND SHORE PROTECTION

- "Arkansas River Plan," William Whipple (Sept WW3:2597)
- "Breakwaters in the Hawaiian Islands," Robert Q. Palmer (June WW2:2507)
- "Effects of Flood Flow on Channel Boundaries," D. A. Parsons (Apr HY4:21:2443)
- "Russian River Channel Works," Israel H. Steinberg (Nov WW4:17:2647)
- "Sand By-Passing Project for Shark River Inlet," W. Mack Angus (Sept WW3:2599)
- "Studies of a Channel Through Padre Island, Texas," E. A. Hansen (Sept WW3:2601)
- "Tetrapods and Other Precast Blocks for Breakwaters," P. Danels, E. Chapus, and R. Dhaille (Sept WW3:2590)

SILT AND SILTING, CHANNEL

- "Mean Direction of Waves and Wave Energy," Omar J. Lillevang (Mar WW1:2423)
- "Sediment Problems of the Lower Colorado River," Whitney M. Borland and Carl R. Miller (Apr HY4:61:2452)

SILT AND SILTING (General)

- "Design of Inlets for Texas Coastal Fisheries," H. P. Carothers and Homer C. Innis (Sept WW3:2603)
- "Sedimentation in Reservoirs in the Southeast," John E. Jenkins, Charles E. Moak, and Daniel A. Okun (July SA4:55:2556)
- "Southwest Pass-Mississippi River 40-ft Channel," Austin B. Smith (Sept WW3:2606)
- "Trap Efficiency of Reservoirs, Debris Basins, and Debris Dams," Charlie M. Moore, Walter J. Wood, and Graham W. Renfro (Feb HY2:69:2374)

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- "Hood Inlet for Closed Conduit Spillways," Fred W. Blaisdell (May HY5:2478)

SOIL MECHANICS

- "Anchored Bulkhead Design by Numerical Method," F. E. Richart, Jr. (Feb SM1:29:2373)
- "Computer Analysis of Slope Stability," John A. Horn (June SM3:2501)
- "Computer Solution of Pressure Distribution Problem," U. W. Stoll (Dec SM6:1:2670)
- "Dewatering the Port Allen Lock Excavation," Charles I. Mansur and Robert I. Kaufman (Dec SM6:35:2683)
- "Drag Coefficients of Locomotion over Viscous Soils," Ervin Hegedus and Robert S. Rowe (Apr SM2:63:2448)
- "Fundamental Aspects of Thixotropy in Soils," James K. Mitchell (June SM3:2522)
- "Generalized Solutions for Laterally Loaded Piles," Hudson Matlock and Lymon C. Reese (Oct SM5:2626)
- "Mechanics of the Triaxial Test for Soils," R. M. Haythornthwaite (Oct SM5:2625)
- "Roadbeds on Highways and Airport Runways," Ira B. Mullis (Mar HW1:2412)
- "Soil Freezing to Reconstruct a Railway Tunnel," George J. Low (Nov CO3:2639)
- "Soil Structure and the Step-Strain Phenomenon," D. H. Trollope and C. K. Chan (Apr SM2:1:2431)
- "Stress Conditions in Triaxial Compression," A. Balla (Dec SM6:57:2684)
- "Tuttle Creek Dam of Rolled Shale and Dredged Sand," K. S. Lane and R. G. Fehrman (Dec SM6:11:2670)
- "Underground Structures Subject to Air Overpressure," Ernest T. Selig, Keith E. McKee, and Eben Vey (Aug EM4:87:2575)

SPILLWAYS (Geographical)

- OLD RIVER
 - "Flood Distribution Problems Below Old River," Frederic M. Chatry (Aug HY8:1:2570)

STEEL

- "Analysis of Frames with Nonlinear Behavior," Alfredo Hua-Sing Ang (June EM3:2479)
- "Commentary on Plastic Design in Steel: Compression Members: Progress Report No. 5, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division," Lynn S. Beedle, Chmn. (Jan EM1:117:2342)
- "Design of Self-Supported Steel Transmission Towers," R. N. Bergstrom, J. R. Arena, and J. M. Kramer (June PO3:2515)
- "New Aspects Concerning Inelastic Instability of Steel Structures," Bruno Thurlimann (Jan ST1:99:2351)
- "Physical Metallurgy and Mechanical Properties: Brittle Fracture," B. L. Averbach (Dec EM6:29:2686)

STEEL Continued

- "Properties of Steel and Concrete and the Behavior of Structures," George Winter (Feb ST2: 2384)
- "Review of Research on Composite Steel-Concrete Beams," Ivan M. Viest (June ST6:2496)
- "Shear Diaphragms of Light Gage Steel," Arthur H. Nilson (Nov ST11:111:2650)
- "Stability Considerations in the Design of Steel Plate Girders," Charles E. L. Massonnet (Jan ST1:71:2350)
- "Stability Problems of Compressed Steel Members and Arch Bridges," George Wastlund (June ST6:2512)

STRESS AND STRAIN

- "Basic Column Strength," Lynn S. Beedle and Lambert Tall (July ST7:109:2552)
- "Comparative Study of a Segmental Arch Ring," O. C. Zienkiewicz (Jan EMI:19:2332)
- "Design Principles for Underground Salt Cavities," Shosel Serata and Earnest Gloyna (May SA3:2468)
- "Digital Computers for Trial-Load Analysis of Arch Dams," L. R. Scrivner (Aug PO4:1:2568)
- "Discontinuity Stresses in Beams on Elastic Foundations," Joseph Penzien (Apr ST4:67:2441)
- "Dynamic Testing of Pavements," W. Heukelom and C. R. Foster (Feb SM1:1:2368)
- "Effect of Floor Systems on Pony Truss Bridges," Robert M. Barnoff and William G. Mooney (Apr ST4:25:2436)
- "Geometry of Moire Fringes in Strain Analysis," Stanley Morse, August J. Durelli, and Cesar A. Sciammarella (Aug EM4:105:2576)
- "Membrane Stresses in Hyperboloid Shells of Revolution," Placido Cicala (Oct EM5:2628)
- "Plastic Analysis of Shallow Conical Shells," E. T. Onat (Dec EM6:1:2675)
- "Properties of Steel and Concrete and the Behavior of Structures," George Winter (Feb ST2: 2384)
- "Secondary Stresses in Parallel Wire Suspension Cables," Thomas Alan Wyatt (July ST7:37: 2542)
- "Stress Analysis of Rigid Frame Bridges with Inclined Legs," Shih-Yuan Cheng (Dec ST12:1: 2668)
- "Stress Conditions in Triaxial Compression," A. Balla (Dec SM6:57:2684)
- "Stresses in Layered Elastic Solids," M. M. Lemcoe (Aug EM4:1:2565)
- "Structural Engineering Aspects of Nuclear Power Plants," Lewis L. T. Au and Edward Y. W. Tsui (June ST6:2509)
- "Test on a 120-ft-Span Prestressed Concrete Beam," G. D. Base and R. E. Rowe (Sept ST9: 2608)
- "Tests on Prestressed Concrete Embedded Cylinder Pipe," Hugh F. Kennison (Nov HY9:77: 2655)
- "Ultimate Strength of Over-Reinforced Beams," Ladislav B. Kriz and Seng-Lip Lee (June EM3: 2502)
- "Vibrations and Stability of Plates Under Initial Stress," George Herrmann and Anthony E. Armenakas (June EM3:2500)
- Computer," W. J. Brignac and R. G. Schwendler (June EM3:2499)
- "Bar-Chain Method Analyzing Truss Deformation," S. L. Lee and P. C. Patel (May ST5:2477)
- "Basic Column Strength," Lynn S. Beedle and Lambert Tall (July ST7:109:2552)
- "Buckling of One-Story Frames and Buildings," John E. Goldberg (Oct ST10:2629)
- "Charts for Design of Reinforced Concrete Columns," W. H. Gardner, Jr. and Donald H. Kline (May ST5:2461)
- "Concepts of Structural Safety," C. B. Brown (Dec ST12:39:2678)
- "Containment Studies for an Atomic Power Plant," William McGuire and Gordon P. Fisher (June PO3:2508)
- "Continuous Girder Bridge with Variable Moment of Inertia," Sabri Sami (Jan ST1:19:2346)
- "Corrected Deflection Theory of Suspension Bridges," John Szidarovsky (Nov ST11:25:2638)
- "Design Considerations for Fatigue in Timber Structures," Wayne C. Lewis (May ST5:2470)
- "Design of Self-Supported Steel Transmission Towers," R. N. Bergstrom, J. R. Arena, and J. M. Kramer (June PO3:2515)
- "Design of Welded Aluminum Structures," H. N. Hill, J. W. Clark, and R. J. Brungraber (June ST6:2528)
- "Design Pressure for a Reactor Containment Vessel," John A. Bailey (Feb ST2:2382)
- "Discontinuity Stresses in Beams on Elastic Foundations," Joseph Penzien (Apr ST4:67:2441)
- "Distribution of Extreme Winds in the United States," H. C. S. Thom (Apr ST4:11:2433)
- "Dynamic Analysis of Elasto-Plastic Structures," Glen V. Berg and Donald A. DaDeppo (Apr EM2:35:2440)
- "Dynamic Effects of Earthquakes," Ray W. Clough (Apr ST4:49:2437)
- "Effective Length of Framed Columns," Thomas C. Kavanagh (Feb ST2:2363)
- "Effect of Floor Systems on Pony Truss Bridges," Robert M. Barnoff and William G. Mooney (Apr ST4:25:2436)
- "Flow Graphs in Structural Analysis," Kurt H. Gerstle (Oct ST10:2634)
- "Freezing and Thawing Effects on Prestressed Concrete," M. J. Gutzwiller and F. E. Musleh (Oct ST10:2633)
- "Geometry of Moire Fringes in Strain Analysis," Stanley Morse, August J. Durelli, and Cesar A. Sciammarella (Aug EM4:105:2576)
- "The Impact of Computers on Engineering Education," Gordon P. Fisher (Apr ST4:1:2428)
- "Influence of Partial Base Fixity on Frame Stability," Theodore V. Galambos (May ST5: 2480)
- "Italian Arch Dam Design and Model Confirmation," Guido Oberti (Mar ST3:2410)
- "Lateral Buckling of Beams," J. W. Clark and H. N. Hill (July ST7:175:2559)
- "Limit Design of Reinforced Concrete Beams," D. T. Wright and C. Berwanger (July ST7:1:2541)
- "Load Distribution in Composite Girder-Slab System," G. Hondros and J. G. Marsh (Nov ST11: 79:2645)
- "Long Span Prestressed Concrete Folded Plate Roofs," John C. Brough, Jr. and B. H. Stephens, Jr. (Oct ST10:2630)
- "Matrix Analysis of Plane Rigid Frames," Fernando Venancio Filho (July ST7:95:2547)
- "Matrix Formulation of the Folded Plate Equations," A. C. Scordelis (Oct ST10:2617)

STRUCTURAL DYNAMICS

- "Bank Protection on Central Valley Streams, California," R. W. Barsdale (Nov WW4:1:2642)

STRUCTURAL ENGINEERING

- "Aircraft Structural Analysis on an Analog

STRUCTURAL ENGINEERING Continued

- "Method for Analysis of Multibeam Bridges," John E. Duberg, Narbey Khachaturian, and Raul E. Fradinger (July ST7:109:2552)
- "Minimum Cost Design of Large Support Rings," Kenneth P. Buchert (May ST5:2473)
- "Movements of a Cable Due to Changes in Loading," Hanes Michalos and Charles Birnstiel (Dec ST12:23:2674)
- "New Aspects Concerning Inelastic Instability of Steel Structures," Bruno Thurlimann (Jan ST1:99:2351)
- "Orthogonal Gridworks Loaded Normally to their Planes," Ignacio Martin and Jose Hernandez (Jan ST1:1:2344)
- "Periods of Framed Buildings for Earthquake Analysis," Mario G. Salvadori and Ewald Heer (Dec ST12:59:2680)
- "Principle of Virtual Work in Structural Analysis," Frank Di Maggio (Nov ST11:65:2643)
- "Properties of Steel and Concrete and the Behavior of Structures," George Winter (Feb ST2:2384)
- "Rationale for Determining Design Wind Velocities," A. G. Davenport (May ST5:2476)
- "Reinforced Concrete Shear Wall Assemblies," Jack R. Benjamin and Harry A. Williams (Aug ST8:1:2566)
- "Research on Fire Resistance of Prestressed Concrete," Hubert Woods (Nov ST11:53:2640)
- "Restrained Columns," Morris Ojalvo (Oct EM5:2615)
- "Review of Research on Composite Steel-Concrete Beams," Ivan M. Viest (June ST6:2496)
- "Secondary Stresses in Parallel Wire Suspension Cables," Thomas Alan Wyatt (July ST7:37:2542)
- "Shear Diaphragms of Light Gage Steel," Arthur H. Nilson (Nov ST11:111:2650)
- "The Shell Vault of the Exposition Palace, Paris," Nicolas Esquillan (Jan ST1:41:2347)
- "Simply Supported Corner Plate," Mario G. Salvadori and H. G. Reggini (Nov ST11:141:2654)
- "Some Basic Concepts in Matrix Structural Analysis," Frank R. Berman (Aug ST8:59:2582)
- "Stability Considerations in the Design of Steel Plate Girders," Charles E. L. Massonet (Jan ST1:71:2350)
- "Stability Problems of Compressed Steel Members and Arch Bridges," George Wastlund (June ST6:2512)
- "Static Tension Tests of Compact Bolted Joints," Robert T. Foreman and John L. Rumpf (June ST6:2523)
- "Strength of Welded Aluminum Columns," R. J. Brungaber and J. W. Clark (Aug ST8:33:2581)
- "Stress Analysis of Rigid Frame Bridges with Inclined Legs," Shih-Yuan Cheng (Dec ST12:1:2668)
- "Structural Engineering Aspects of Nuclear Power Plants," Lewis L. T. Au and Edward Y. W. Tsui (June ST6:2509)
- "Structural Model Analysis by Means of Moire Fringes," A. J. Durelli and I. M. Daniel (Dec ST12:93:2693)
- "Summary of the Activities of the Column Research Council," Bruce G. Johnston (Jan ST1:13:2345)
- "Tentative Recommendations for the Design and Construction of Composite Beams and Girders for Buildings: Progress Report, Joint ASCE-ACI Committee on Composite Construction," Philip P. Page, Chmn. (Dec ST12:73:2692)

- "Test of a Riveted Plate Girder with a Thin Web," Desi D. Vasarhelyi, Jim C. Taylor, Naresh C. Vasisht, and Chia-Yao Yuan (Oct ST10:2621)
- "Test on a 120-ft-Span Prestressed Concrete Beam," G. D. Base and R. E. Rowe (Sep ST9:2608)
- "Torsional Analysis of Suspension Bridge Towers," Frank Baron and Anthony G. Arioto (Jan ST1:143:2354)
- "Underground Structures Subject to Air Overpressure," Ernest T. Selig, Keith E. McKee, and Eben Vey (Aug EM4:87:2575)
- "Use of Continuity-Factor and Final Position," Yon-Sun Chou (Nov ST11:1:2637)
- "Various Instability Modes of the Fixed Base Column," D. A. Sawyer (July ST7:61:2544)
- "Vibrations of Structural Systems by Component Mode Synthesis," Walter C. Hurty (Aug EM4:51:2571)
- "Wind Stresses in Domes," P. Gondikas and M. G. Salvadori (Oct EM5:2616)

STRUCTURES (General)

- "Electrical Analog Computer for Limit Design of Structures," M. Zaid and F. L. Ryder (Jan EM1:1:2331)
- "Matrix Formulation of the Folded Plate Equations," A. C. Scordelis (Oct ST10:2617)

STRUCTURES, THEORY OF (General)

- "Analysis of Frames with Nonlinear Behavior," Alfredo Hua-Sing Ang (June EM3:2479)
- "Continuous Girder Bridge with Variable Moment of Inertia," Sabri Sami (Jan ST1:19:2346)
- "Flow Graphs in Structural Analysis," Kurt H. Gerstle (Oct ST10:2634)
- "Orthogonal Gridworks Loaded Normally to their Planes," Ignacio Martin and Jose Hernandez (Jan ST1:1:2344)
- "Principle of Virtual Work in Structural Analysis," Frank DiMaggio (Nov ST11:65:2643)
- "Use of Continuity-Factor and Final Position," Yon-Sun Chou (Nov ST11:1:2637)

SURVEYING

- "Airborne Surveying with Doppler Systems," L. R. Chapman, Jr. (Feb SU1:2378)
- "The Builder of the Newport (Rhode Island) Tower," Edward Adams Richardson (Feb SU1:2383)
- "The Calculating Machine in Coordinate Geometry," Bela Vadasz (Feb SU1:7:2367)
- "Civil Engineering Curriculum for Federal Surveying and Mapping," G. C. Tewinkel (Feb SU1:2387)
- "Electric Analog for Triangulation Adjustment," Hsuan-Loh Su (Feb SU1:43:2370)
- "Highway and Bridge Surveys: Analytic Geometry in Highway Design and Layout, Progress Report, Committee on Engineering Surveys, Surveying and Mapping Division," Arnold A. Katterhenry, Chmn. (July SU2:1:2548)
- "Intersection of Straight Line with Spiral," T. F. Hickerson (Feb SU1:2379)
- "SDR Survey for Proposed Chesapeake Bay Crossing," Walter C. Beckmann, Charles L. Drake, and George H. Sutton (July SU2:19:2553)
- "Self-Checking Method of Computing Curve Elevations," Charles M. Lamont (Feb SU1:1:2365)
- "Surveying in the Civil Engineering Curriculum," Kenneth S. Curtis (Feb SU1:2386)
- "Surveys at Cougar Reservoir," Charles N. Oros (July SU2:13:2550)

SURVEYS AND SURVEYING, AERIAL

- "Aerial Photography in Arctic and Subarctic Engineering," Robert E. Frost (May AT1:2463)
- "Airborne Surveying with Doppler Systems," L. R. Chapman, Jr. (Feb SU1:2378)
- "Airphoto Interpretation for Airfield Site Location," James H. McLerran (May AT1:2467)
- "Topographic Mapping in Alaska," Reynold S. Isto (Feb SU1:2388)

TANKS (General)

- "Development of Flow in Tank Draining," David Burgreen (Mar HY3:2415)

TANKS, SEDIMENTATION (sewage)

- "Behavior of Suspensions," A. W. Bond (May SA3:2474)
- "Design and Cost Consideration in High Rate Sludge Digestion," Alfred A. Estrada (May SA3:2479)

TANKS, SLUDGE DIGESTION

- "Fundamental Considerations in High-Rate Digestion," Clair N. Sawyer and Jay S. Grumbling (Mar SA2:2411)

TIDES

- "Design of Inlets for Texas Coastal Fisheries," H. P. Carothers and Homer C. Innis (Sept WW3:2603)
- "Pneumatic Barrier Against Salt Water Intrusion," Ian Larsen (Sept WW3:2600)

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- "Design Considerations for Fatigue in Timber Structures," Wayne C. Lewis (May ST5:2470)

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- "Design of Self-Supported Steel Transmission Towers," R. N. Bergstrom, J. R. Arena, and J. M. Kramer (June PO3:2515)
- "Torsional Analysis of Suspension Bridge Towers," Frank Baron and Anthony G. Ariotti (Jan ST1:143:2354)

TRAFFIC (General)

- "Evaluation of Alternative Subway Routes," B. A. Griffith and H. G. von Cube (May CP1:2462)
- "Prediction of Maximum Practical Berth Occupancy," Thomas J. Fratar, Alvin S. Goodman, and Austin E. Brant, Jr. (June WW2:2517)
- "Sacramento River Deep Water Ship Channel: Functional Planning," Amalio Gomez (Nov WW4:53:2649)

TRAFFIC, HIGHWAY AND ROAD

- "Freeway Spacing in Urban Freeway System," James M. Peterson (Sept HW3:2596)
- "Traffic Behavior and Freeway Ramp Design," Charles Pinnell and Charles J. Keese (Sept HW3:2596)

TRAFFIC, STREET

- "Analyzing and Projecting Travel Data," Wilbur S. Smith (June HW2:2513)
- "Public Transit Improvements in Toronto," W. F. Irvin (May CP1:2465)

TRANSPORTATION

- "Analyzing and Projecting Travel Data," Wilbur S. Smith (June HW2:2513)
- "Developing Alternative Urban Transportation Systems," William R. McConochie (Mar HW1:2417)

- "Evaluation of Alternative Subway Routes," B. A. Griffith and H. G. von Cube (May CP1:2462)

- "Freeway Spacing in an Urban Freeway System," James M. Peterson (Sept HW3:2596)
- "Public Transit Improvements in Toronto," W. F. Irvin (May CP1:2465)

TRUSSES (General)

- "Bar-Chain Method for Analyzing Truss Deformation," S. L. Lee and P. C. Patel (May ST5:2477)
- "Construction of Morrison Bridge," Raymond D. Bane (May CO2:2482)

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- "Design Principles for Underground Salt Cavities," Shosel Serata and Earnest Gloyna (May SA3:2468)
- "Evaluation of Alternative Subway Routes," B. A. Griffith and H. G. von Cube (May CP1:2462)
- "Soll Freezing to Reconstruct a Railway Tunnel," George J. Low (Nov CO3:1:2639)

VALVES

- "Models Primarily Dependent on the Reynolds Number," W. P. Simmons, Jr. (June HY6:2531)

VIBRATION

- "Dynamic Testing of Pavements," W. Heukelom and C. R. Foster (Feb SM1:1:2368)
- "Electrical Energy Analogs of Vibrating Beams," Frederick L. Ryder (Oct EM5:2620)
- "End-Fixity Effect on Vibration and Instability," David Burgreen (Dec EM6:2679)
- "Foundation Vibrations," F. E. Richart, Jr. (Aug SM4:1:2564)
- "Vibrations and Stability of Plates Under Initial Stress," George Herrmann and Anthony E. Armenakas (June HY3:2500)
- "Vibrations of Structural Systems by Component Mode Synthesis," Walter C. Hurty (Aug EM4:51:2571)

VIRTUAL WORK, PRINCIPLE OF

- "Matrix Analysis of Plane Rigid Frames," Fernando Venancio Filho (July ST7:95:2547)
- "Principle of Virtual Work in Structural Analysis," Frank DiMaggio (Nov ST11:65:2643)

WATER, CONSUMPTIVE USE OF

- "Method for Estimating Consumptive Use of Water for Agriculture," Wendell C. Munson (Dec IR4:45:2672)

WATER, FLOW OF, (General)

- "Capacitance Method of Measuring Water Film Thickness," Robert H. Black (June HY6:2524)
- "A Comparison of Stream Velocity Meters," F. Wayne Townsend and F. A. Blust (Apr HY4:11:2438)
- "Early History of Hydrometry in the United States," Steponas Kolupaila (Jan HY1:1:2335)
- "The Fourth Root n-f Diagram," T. Blench (Jan HY1:63:2340)
- "Generalized Distribution Network Head Loss Characteristics," M. B. McPherson (Jan HY1:75:2339)
- "Irrotational Motion of Two Fluid Strata Towards a Line Sink," D. G. Huber (Aug EM4:71:2573)
- "Jet Diffusion in Liquid of Greater Density," G. Abraham (June HY6:2506)

WATER, FLOW OF (General) Continued

"Scour at Bridge Crossings," Emmet M. Laur-
sen (Feb HY2:39:2369)

"Unsteady Flow of Ground Water into a Surface
Reservoir," William Haushild and Gordon Kruse
(July HY7:13:2551)

WATER, FLOW OF, IN OPEN CHANNELS

"Boundary Layer Stimulation in Rectangular
Conduits," R. G. Cox and F. L. Bauer (Feb HY2:
25:2366)

"Effects of Flood Flow on Channel Boundaries,"
D. A. Parsons (April HY4:21:2443)

"Flume Studies of Flow in Steep, Rough Chan-
nels," Dean F. Peterson and P. K. Mohanty (Nov
HY9:55:2653)

"Resistance to Flow in Alluvial Channels,"
Daryl B. Simons and E. V. Richardson (May
HY5:2485)

"Uniform Water Conveyance Channels in Allu-
vial Material," Daryl B. Simons and Maurice L.
Albertson (May HY5:2484)

"Vortex Tube and Sand Trap," A. R. Robinson
(Dec IR4:1:2669)

"World Practices in Water Measurements in
Turnouts," Charles W. Thomas (June IR2:2530)

WATER, FLOW OF, IN PIPES

"Derivation of Flow Equations for Sewage
Sludges," Vaughn C. Behn (Nov SA6:59:2663)

"Development of Flow in Tank Draining," David
Burgreen (Mar HY3:2415)

"Friction Losses on Lines with Service Con-
nections," David L. Muss (Apr HY4:35:2449)

"Generalized Distribution Network Head Loss
Characteristics," M. B. Mc Pherson (Jan HY1:
75:2339)

"Hood Inlet for Closed Conduit Spillways," Fred
W. Blaisdell (May HY5:2478)

WATER SUPPLY (General)

"Automatic System for Monitoring Water Qual-
ity, Twenty-Eighth Progress Report, Committee
on Research, Sanitary Engineering," N. L. Nemer-
ow, Chmn. (July SA4:25:2554)

"Conservancy Districts as Flood Control Organi-
zations," Cloyde C. Chambers (Apr HY4:1:2429)

"Geophysical Procedures in Ground Water
Study," H. R. McDonald and Dart Wantland (Sept
IR3:2598)

"Man Versus Environment: Twenty-Seventh
Progress Report, Committee on Research, Sanitary
Engineering Division," N. L. Nemerow,
Chmn. (July SA4:13:2549)

"Role of Price in the Allocation of Water Re-
sources," Lawrence G. Hines (Jan SA1:15:2343)

WATER SUPPLY (Geographical)

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"Design of Karadj Hydroelectric Project,"
Richard D. Harza and Robert F. Edbrooke (Aug
PO4:31:2579)

IRAQ

"Irrigation Systems of the Tigris and Euphrates
Valleys," Stanley S. Butler (Dec IR4:59:2673)

LOS ANGELES

"Los Angeles Water Supply and Irrigation,"

Samuel B. Morris (Dec IR4:35:2671)

OHIO

"Regional Planning in Cuyahoga County, Ohio,"
Alfred A. Estrada (May SA3:2471)

RUSSIA

"Russian Water Supply and Treatment Prac-
tices," V. J. Calise and W. A. Homer (Mar SA2:
2407)

WATER TRANSPORTATION

"Prediction of Maximum Practical Berth Oc-
cupancy," Thomas J. Fratar, Alvin S. Goodman,
and Austin E. Brant, Jr. (June WW2:2517)

WATER TREATMENT

"Investigation of the Corrosive Behavior of
Waters," Werner Stumm (Nov SA6:27:2657)

"Low Pressure Aeration of Water and Sewage,"
N. Claes H. Fischerstrom (Sept SA5:2607)

"Russian Water Supply and Treatment Prac-
tices," V. J. Calise and W. A. Homer (Mar SA2:
2407)

WATERWAYS (General)

"Arkansas River Plan," William Whipple (Sept
WW3:2597)

"Bank Protection on Central Valley Streams,
California," R. W. Barsdale (Nov WW4:1:2642)

"Breakwaters in the Hawaiian Islands," Robert
Q. Palmer (June WW2:2507)

"Hydrology and Flood Control Features at Oro-
ville Dam," Joseph I. Burns, Kenneth B. Mayo,
and William A. Arvola (Nov WW4:33:2648)

"Mean Direction of Waves and Wave Energy,"
Omar J. Lillevang (Mar WW1:2423)

"Plan for Closure of Old River," George M.
Cookson (Sep WW3:2602)

"Russian River Channel Works," Israel H.
Steinberg (Nov WW4:17:2647)

"Sand By-Passing Project for Shark River In-
let," W. Mack Angas (Sept WW3:2599)

"Shock Pressures Exerted by Breaking Waves
on Breakwaters," Shoshichiro Nagai (June WW2:
2504)

"Southwest Pass-Mississippi River 40-ft Chan-
nel," Austin B. Smith (Sept WW3:2606)

"Studies of a Channel Through Padre Island,
Texas," E. A. Hansen (Sept WW3:2601)

"Tetrapods and Other Precast Blocks for Break-
waters," P. Danels, E. Chapus, and R. Dhaille
(Sept WW3:2590)

"Transmission of Waves Past a Rigid Vertical
Thin Barrier," Robert L. Wiegel (Mar WW1:
2413)

"Waves in Navigation Channels Due to Lock
Filling," Hans-Werner Partenscky (Mar WW1:
2422)

WATERWAYS (Geographical)

"Breakwaters in the Hawaiian Islands," Robert
Q. Palmer (June WW2:2507)

CANADA

"Canadian Section of the St. Lawrence Seaway,"
Lawrence H. Burpee (Mar WW1:2420)

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"Hydraulic Models of the St. Lawrence Power Project" (May 59 HY5:147:2022)
Dsc: G. T. Berry, G. B. Fenwick and F. R. Brown (Dec 59 HY12:113,115:2271)
Clo: June HY6:77:2535
- BUCHERT, KENNETH P.**
"Minimum Cost Design of Large Support Rings" (May ST5:25:2473)
- BURCH, JAMES S.**
Dsc (Dec HW4:56:2694) of "Analyzing and Projecting Travel Data" (June HW2:1:2513)
- BURGEE, DAVID**
"Development of Flow in Tank Draining" (Mar HY3:13:2415)
"End-Fixity Effect on Vibration and Instability" (Dec EM6:13:2679)
- BURNET, LEO L.**
Dsc (Jan HY1:95:2349) of "Floods of the Florida Everglades" (June 59 HY6:43:2058)
- BURNS, JOSEPH I.**
"Hydrology and Flood Control Features of Oroville Dam," with Kenneth B. Mayo and William A. Arvola (Nov WW4:33:2648)
- BURPEE, LAWRENCE H.**
"Canadian Section of the St. Lawrence Seaway" (Mar WW1:27:2420)
- BUTLER, STANLEY S.**
"Irrigation Systems of the Tigris and Euphrates Valleys" (Dec IR4:59:2673)
- BYCROFT, G. N.**
"Electrical Analog for Earthquake Yield Spectra," with M. J. Murphy and K. J. Brown (Oct 59 EM4:43:2197)
Dsc: Glen V. Berg and Spiro S. Thomades, T. K. Caughey, G. W. Housner and D. E. Hudson, O. A. Glogau (April EM2:165,171,172:2455) John A. Blume (June EM3:177:2532)
Clo: Dec EM6:93:2691

- BYCROFT, G. N. Continued
"White Noise Representation of Earthquakes" (April EM2:1:2434)
Dsc: D. E. Hudson, G. W. Housner and T. K. Caughey (Aug EM4:193:2583)
- BYERS, HORACE R.
"The Nature of Cloud Systems" (Mar LR1:107:2401)
- CALISE, V. J.
"Russian Water Supply and Treatment Practices," with W. A. Homer (Mar SA2:1:2407)
Dsc: K. J. Ives (July SA4:101:2561)
- CAKMAK, AHMET
See Morris Ojalvo (April EM2:59:2445)
- CAMPEN, W. H.
Dsc (Dec HW4:40:2694) with L. G. Erickson and J. R. Smith of "Roadbeds on Highways and Airport Runways" (Mar HW1:1:2412)
- CARLSON, CHARLES E.
Dsc (Mar HW1:77:2418) of "The Electronic Computer in Highway Engineering" (Sept 59 HW3:37:2146)
- CAROTHERS, H. P.
"Design of Inlets for Texas Coastal Fisheries," with Homer C. Innis (Sept WW3:103:2603)
- CARTER, R. W.
See D. R. Dawdy (June HY6:93:2535)
- CARY, ALLEN S.
"Rockfill Dams: Performance of Mud Mountain Dam" (Aug 58 PO4:1745)
Dsc: J. B. Cooke, F. L. Lawton (April 59 PO2:87:2013)
No clo: June PO3:102:2537
Clo: Oct PO5:27:2631
- CASS, JAMES R., JR.
"Subsurface Explorations in Permafrost Areas" (Oct 59 SM5:31:2212)
Dsc: G. H. Johnston, G. Robert Lange, Henry W. Stevens and William P. Verville (June SM3:63,65:2538)
- CATTON, MILES D.
"Early Soil-Cement Research and Development" (Jan 59 HW1:1:1899)
Dsc: Carlton N. Conner, C. W. Britzius, K. B. Woods, L. S. Blake, H. F. Clemmer, E. J. Kilcawley, Ellis Danner, D. J. Maclean and Pitt H. Jones, Rupert L. Springenschmid, V. J. Brown, Hans F. Winterkorn, W. R. Thomson (Sept 59 HW3:77,79,80,81,83,84,86,87,88,92:2180)
Clo: Mar HW1:67:2418
Dsc (June SM3:113:2538) of "A Review and Evaluation of Soil-Cement Pavements" (Dec 59 SM6:49:2294)
- CAUGHEY, T. K.
Dsc (April EM2:171:2455) with G. W. Housner and D. E. Hudson of "Electrical Analog for Earthquake Yield Spectra" (Oct 59 EM4:43:2197)
See D. E. Hudson (Aug EM4:193:2583)
- CEDERGREN, HARRY R.
"Seepage Requirements of Filters and Pervious Bases" (Oct SM5:15:2623)
- CEDERGREN, HARRY R. Continued
Dsc (April SM2:121:2459) of "Design of Under-seepage Control Measures for Dams and Levees" (Oct 59 SM5:129:2217)
Dsc (June SM3:69:2538) of "Rate of Constructing Embankments on Soft Foundation Soils" (Oct 59 SM5:61:2214)
- CELENZA, P.
See J. V. Radziul (Aug HY8:57:2587)
- CHAMBERLAIN, A. R.
Dsc (Mar HY3:67:2426) of "Friction Factors in Corrugated Metal Pipe" (Sept 59 HY9:69:2148)
- CHAMBERS, CLOYDE C.
"Conservancy Districts as Flood Control Organizations" (April HY4:1:2429)
Dsc: Henry J. Tebow (July HY7:55:2562)
Samuel A. Greeley (Nov HY9:153:2665)
- CHAN, C. K.
See H. B. Seed (Oct 59 SM5:87:2216)
See D. H. Trollope (April SM2:1:2431)
- CHAPMAN, J. C.
Dsc (Dec ST12:127:2697) of "Review of Research on Composite Steel-Concrete Beams" (June ST6:1:2496)
- CHAPMAN, L. R., JR.
"Airborne Surveying with Doppler Systems" (Feb SU1:57:2378)
- CHAPUS, E.
See P. Danel (Sept WW3:1:2590)
- CHARLES, J. L.
"Permafrost Aspects of Hudson Bay Railroad" (Dec 59 SM6:125:2319)
Dsc: K. A. Linell (Aug SM4:95:2586)
- CHATRY, FREDERIC M.
"Flood Distribution Problems Below Old River" (Aug HY8:1:2570)
- CHENG, SHIH-YUAN
"Stress Analysis of Rigid Frame Bridges with Inclined Legs" (Dec ST12:1:2668)
- CHERNIAK, NATHAN
"Passenger Data for Urban Transportation Planning" (Dec 59 HW4:37:2275)
Dsc: N. C. Raab, Burton H. Sexton, William R. McConochie, John C. Kohl, Harold M. Lewis, William H. Claire (June HW2:45,48,51,52,57:2533) Henry A. Barnes, John Rannels, Charles M. Noble, Hawley S. Simpson, Virden A. Rittgers, Seymour Kashin (Sept HW3:61,62,64,68,71:2614)
Clo: Dec HW4:29:2694
Dsc (Dec HW4:52:2694) of "Developing Alternative Urban Transportation Systems" (Mar HW1:47:2417)
- CHILDS, L. D.
"Tests of Concrete Pavements on Gravel Sub-bases," with J. W. Kapernick (Oct 58 HW3:1800)
Dsc: Bengt F. Friberg (Sept 59 HW3:69:2180)
Clo: June HW2:39:2533
- CHINN, JAMES
Dsc (April SM2:101:2459) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)

- CHITALE, S. V.
Dsc (Aug HY8:41:2587) with K. Arunachalam of "Two Methods to Compute Water Surface Profiles" (April 59 HY4:79:1997)
Dsc (Nov HY9:137:2665) of "Scour at Bridge Crossing" (Feb HY2:39:2369)
- CHOU, YON-SUN
"Use of Continuity-Factor and Final Position" (Nov ST11:1:2637)
- CHOW, LEE
"Development of Rotational Irrigation in Taiwan" (Sept IR3:1:2568)
Dsc (Dec IR4:135:2695) of "World Practices in Water Measurement at Turnouts" (June IR2:29:2530)
- CHOW, VEN TE
"Determination of Hydrologic Frequency Factor" (July 59 HY7:93:2084)
Dsc: L. L. Weiss (Jan HY1:113:2349)
William Sammons (Feb HY2:107:2381)
Clo: Aug HY8:55:2587
Dsc (Aug HY8:73:2587) of "Tolkmitt's Backwater and Dropdown Curve Tables" (May HY5:1:2469)
- CHU, KUANG-HAN
Dsc (May ST5:131:2491) of "Lessons of Collapse of Vancouver 2nd Narrows Bridge" (Dec 59 ST10:1:2305)
- CICALA, PLACIDO
"Membrane Stresses in Hyperboloid Shells of Revolution" (Oct EM5:147:2628)
- CLAIRE, WILLIAM H.
Dsc (June HW2:57:2533) of "Passenger Data for Urban Transportation Planning" (Dec 59 HW4:37:2275)
- CLARE, K. E.
See D. J. Mac Lean (June SM3:115:2538)
- CLARK, C. O.
Dsc (May HY5:121:2489) of "Consistency in Unitgraphs" (Aug 59 HY8:39:2128)
- CLARK, J. W.
"Lateral Buckling of Beams," with H. N. Hill (July ST7:175:2559)
See R. J. Brungraber (Aug ST8:33:2581)
See H. N. Hill (June ST6:101:2528)
- CHRISTIANSEN, J. E.
"Irrigation and Drainage Problems in Uruguay" (June IR2:1:2494)
- CHRISTIANSEN, JORGEN
See Marcel Bitoun (Feb SM1:99:2391)
- CHUN, ROBERT Y. D.
See Raymond C. Richter (Dec 59 IR4:1:2281)
- CLOUGH, RAY W.
"Dynamic Effects of Earthquakes" (April ST4:49:2437)
Dsc: Clarence J. Derrick, G. W. Housner (Aug ST8:103,107:2585) A. A. Eremin (Oct ST10:151:2635) John A. Blume (Dec ST12:123:2697)
Dsc (Jan ST1:129:2353) of "Matrix Solution of Beams with Variable Moments of Inertia" (Oct 59 ST8:1:2218)
- COATES, D. F.
Dsc (June SM3:128:2538) of "Dynamic Testing of Pavements" (Feb SM1:1:2368)
Dsc (Aug SM4:99:2586) of "Soil Structure and the Step-Strain Phenomenon" (April SM2:1:2431)
Dsc (Dec SM6:103:2696) of "Foundation Vibrations" (Aug SM4:1:2564)
- COHEN, EDWARD
Dsc (June ST6:141:2539) with A. W. Coutris of "Design of Prestressed Composite Steel Structures" (Nov 59 ST9:97:2262)
Dsc (June EM3:201:2532) with Samuel Weissman of "Behavior of Structures During Earthquakes" (Oct 59 EM4:109:2220)
- COLBY, BRUCE R.
Dsc (May HY5:174:2489) of "Discharge Formula for Straight Alluvial Channels" (Nov 59 HY11:65:2260)
- COLE, E. SHAW
Dsc (June HY6:118:2535) of "Early History of Hydrometry in the United States" (Jan HY1:1:2335)
- COLGATE, DONALD
"Cavitation Damage of Roughened Concrete Surfaces" (Nov 59 HY11:1:2241)
Dsc: A. Thiruvengadam (April HY4:127:2456)
A. Rylands Thomas (May HY5:145:2489)
"Hydraulic Downpull Forces on High Head Gates" (Nov 59 HY11:39:2245)
Dsc: Robert G. Cox and Ellis B. Pickett, W. P. Simmons, Jr. (May HY5:151,162:2489)
- COMPTON, AUGUST W.
"Reinforced Concrete Pavements for Airports" (May AT1:1:2460)
- CONSTANT, PAUL C., JR.
Dsc (July HY7:39:2562) of "Generalized Distribution Network Head Loss Characteristics" (Jan HY1:75:2339)
- COOKE, J. BARRY
"Rockfill Dams: Wishon and Courtright Face Dams" (Aug 58 PO4:1746)
Dsc: Karl Terzaghi (Feb PO1:89:2392)
See I. C. Steele (Aug 58 PO4:1737)
Dsc (Oct PO5:3:2631) of "Rockfill Dams: Brownlee Sloping Core Dam" (Aug 58 PO4:1734)
- COOKSON, GEORGE M.
"Plan for Closure of Old River" (Sept WW3:83:2602)
- COPEN, MERLIN D.
"Design of Arch Dams by Trial Load Method of Analysis" (Aug PO4:13:2569)
Dsc (Sept ST9:29:2612) of "Italian Arch Dam Design and Model Confirmation" (Mar ST3:1:2410)
- COURT, ARNOLD
"Evaluation of Seeding Trials" (Mar IR1:121:2403)
- COUTRIS, A. W.
See Edward Cohen (June ST6:141:2539)
- COWAN, HENRY J.
Dsc (Aug ST8:97:2585) of "Properties of Steel and Concrete and the Behavior of Structures" (Feb ST2:33:2384)

- COX, Robert G.
"Boundary Layer Stimulation in Rectangular Conduits," with F. L. Bauer (Feb HY2:25:2366)
Corr: May HY5:187:2489
Dsc (Mar HY3:31:2426) of "Problems Concerning the Use of Low Head Radial Gates" (Feb 59 HY2:35:1935)
Dsc (May HY5:151:2489) with Ellis B. Pickett of "Hydraulic Downpull Forces on High Head Gates" (Nov 59 HY11:39:2245)
- CRAWFORD, WILLIAM M.
See Douglas R. Brown (Feb SM1:81:2391)
- CRORY, FREDERICK E.
Dsc (Aug SM4:87:2586) of "Pile Construction in Permafrost" (Dec 59 SM6:75:2295)
- CULBERTSON, DON M.
Dsc (May HY5:171:2489) with Paul R. Jordan of "Discharge Formula for Straight Alluvial Channels" (Nov 59 HY11:65:2260)
- CULBERTSON, JAMES K.
Dsc (June HY6:98:2535) with Carl F. Nordin, Jr. of "Discharge Formula for Straight Alluvial Channels" (Nov 59 HY11:65:2260)
- CURTIS, KENNETH S.
"Surveying in the Civil Engineering Curriculum" (Feb SU1:103:2386)
- CURTISS, CHARLES D.
"Highway Research: Progress Report, Committee on Research, Highway Division" (Mar HW1:29:2416)
- DA DEPPO, DONALD A.
See Glen V. Berg (April EM2:35:2440)
- DANEL, P.
"Tetrapods and other Precast Blocks for Breakwaters," with E. Chapus and R. Dhaille (Sept WW3:1:2590)
- DANIEL, I. M.
See A. J. Durelli (Dec ST12:93:2693)
- DANNEMANN, ROBERT
Dsc (June ST6:145:2539) of "Lessons of Vancouver 2nd Narrows Bridge" (Dec 59 ST10:1:2305)
- da SILVEIRA, I.
Dsc (June SM3:77:2538) of "Structure and Strength Characteristics of Compacted Clays" (Oct. 59 SM5:87:2216)
- DAWDY, D. R.
Dsc (June HY6:93:2535) with R. W. Carter of "Discharge Formula for Straight Alluvial Channels" (Nov 59 HY11:65:2260)
- DAVENPORT, A. G.
"Rationale for Determining Design Wind Velocities" (May ST5:39:2476)
- DAVIS, CALVIN V.
"Rockfill Dams: The Derbendi Khan Dam" (Aug 58 PO4:1741)
Dsc: S. Sakurai (April 59 PO2:75:2013)
Clo: June PO3:109:2537
- DAVIS, WILSON L.
"Epoxy Resin for Structural Repair of Concrete Pavement," with Eugene Pinkstaff (Feb CO1:55:2360)
- DAY, DAVID A.
"Engineering Education and the Construction Industry: Graduates for Work in Construction" (Feb 59 CO1:7:1955)
Dsc: Paul F. Keim, Frank W. Stubbs, Jr., Ellis Danner (Sept 59 CO2:53,54,56:2178)
Clo: Feb CO1:73:2377
- DEAN, R. G.
Dsc (June WW2:119:2540) with P. S. Eagleson of "Engineering Aspects of Coastal Sediment Movement" (Sept 59 WW3:11:2168)
See P. S. Eagleson (Oct 59 HY10:53:2202)
See P. S. Eagleson (June WW2:125:2540)
- de CAMPOS, FRANCISCO BARROS
See Ernesto Pichler (Aug 59 SM4:95:2137)
- deCARVALHO, JOSE REIS
Dsc (Mar WW1:151:2419) with Daniel Vera-Cruz of "Laboratory Investigation of Rubble-Mound Breakwaters" (Sept 59 WW3:93:2171)
- DEGENKOLB, H. J.
"Design of Pitched and Curved Timber Diaphragms" (Jan 59 ST1:65:1911)
No clo: Jan ST1:121:2353
- DEIGNAN, J. E.
Dsc (Nov WW4:115:2659) of "Breakwaters in the Hawaiian Islands" (June WW2:39:2507)
- DENNIS, ARNETT S.
"Cloud-Seeding Results in Santa Clara County" (Mar IR1:93:2399)
- de OLIVEIRA, EDGARD
See Luis Henrique Gomes Fernandes (Aug 58 PO4:1747)
- DERRICK, CLARENCE J.
Dsc (April EM2:183:2455) of "Behavior of Structures During Earthquakes" (Oct 59 EM4:109:2220)
Dsc (Aug ST8:103:2585) of "Dynamic Effects of Earthquakes" (April ST4:49:2437)
- DERRINGTON, CLARA F.
Dsc (Nov CO3:69:2664) of "Polyvinyl Acetate and Portland Cement Mortar" (Feb CO1:31:2358)
- DHAILLE, R.
See P. Danel (Sept WW3:1:2590)
- DICKENS, H. B.
"Experience with a Pier-Supported Building over Permafrost," with D. M. Gray (Oct SM5:1:2618)
- DICKINSON, PHILIP P.
"Humid Zone Irrigation in Ceylon" (Dec IR4:101:2682)
- DI MAGGIO, FRANK L.
"Principle of Virtual Work in Structural Analysis" (Nov ST11:65:2643)

- DISKIN, M. H.**
Dsc (Feb HY2:125:2381) of "Friction Factors in Corrugated Metal Pipe" (Sept 59 HY9:69:2148)
Dsc (Nov HY9:157:2665) of "Friction Losses in Lines with Service Connections" (April HY4:35:2449)
- DOELL, CHARLES E.**
Dsc (May CP1:41:2487) of "Coordinating Public Works and Urban Renewal in Kansas City, Kan." (Dec 59 CP2:29:2307)
- DONNAN, WILLIAM W.**
"Drainage and Water Management Research in Western Europe" (June IR2:21:2527)
"Drainage of Agricultural Lands Using Interceptor Lines" (Mar 59 IR1:13:1964)
Dsc: David K. Todd and Jacob Bear (Sept 59 IR3:113:2179) A. R. Robinson, R. H. Brooks (Dec 59 IR4:83,84:2327)
Clo: June IR2:59:2536
Dsc (June IR2:83:2536) of "Drainage Problems of the San Joaquin Valley" (Sept 59 IR3:97:2160)
Dsc (June IR2:70:2536) of "Laboratory Research on Interceptor Drains" (Sept 59 IR3:25:2154)
- DOWNING, A. L.**
Dsc (May SA3:155:2490) of "Absorption of Oxygen from Air Bubbles" (July 59 SA4:89:2090)
- DRAKE, CHARLES L.**
See Walter C. Beckmann (July SU2:19:2553)
- DUBERG, JOHN E.**
"Method for Analysis of Multibeam Bridges," with Narbey Khachaturian and Raul E. Fradinger (July ST7:109:2552)
- DUNHAM, JAMES W.**
"Design Considerations for California Marinas" (Nov WW4:69:2658)
Dsc (Sept WW3:173:2611) of "Mean Direction of Waves and of Wave Energy" (Mar WW1:123:2423)
- DUNN, IRVING S.**
"Tractive Resistance of Cohesive Channels" (June 59 SM3:1:2062)
Dsc: Frank D. Masch, Jr. (April SM2:79:2459)
- DURAN, RAMON**
See Eldridge H. Lovelace (Dec 59 CP2:29:2307)
- DURELLI, AUGUST J.**
"Structural Model Analysis by Means of Moiré Fringes," with I. M. Daniel (Dec ST12:93:2693)
See Stanley Morse (Aug EM4: 105:2576)
- EAGLESON, P. S.**
"Wave-Induced Motion of Bottom Sediment Particles," with R. G. Dean (Oct 59 HY10:53:2202)
Dsc: Robert L. Miller (May HY5:129:2489)
Dsc (June WW2:125:2540) with R. G. Dean of "The Supply and Loss of Sand to the Coast" (Sept 59 WW3:227:2177)
See R. G. Dean (June WW2:119:2540)
- ECKENFELDER, W. WESLEY, JR.**
"Absorption of Oxygen from Air Bubbles" (July 59 SA4:89:2090)
Dsc: Shuichi Aiba, James J. McKeown and Daniel A. Okun (Jan SA1:35,37:2352) A. Pasveer, ECKENFELDER, W. WESLEY, JR. Continued
A. L. Downing (May SA3:151,155:2490)
Clo: May SA3:158:2490)
- EDBROOKE, ROBERT F.**
See E. Montford Fucik (Dec 58 SM5:1864)
See Richard D. Harza (Aug PO4:31:2579)
- EDEN, EDWIN W., JR.**
"Floods of the Florida Everglades" (June 59 HY6:43:2058)
Dsc: J. R. Bowman (Dec 59 HY12:121:2271)
Leo L. Burnet (Jan HY1:95:2349)
Clo: Aug HY8:53:2587
- EHRLER, O. M. CHRISTOF**
Dsc (Oct SM5:131:2636) of "Dynamic Testing of Pavements" (Feb SM1:1:2368)
- EINSTEIN, H. A.**
"An Electric Analog Model of a Tidal Estuary," with James A. Harder (Sept 59 WW3:153:2173)
Dsc: G. B. Fenwick (Mar WW1:161:2419)
- ELLIOT, REED A.**
"Prospecting for Thermal Power Plant Sites" (Feb PO1:1:2361)
- ELLIOTT, ROBERT D.**
"Seeding of West Coast Winter Storms" (Mar IR1:35:2396)
- ELLISON, K. E.**
"Pavement Design Practices in Virginia" (Sept 59 HW3:27:2145)
Dsc: George W. Ring (June HW2:41:2533)
- EMMONS, WALTER F.**
"Control of Cracking in TVA Concrete Gravity Dams," with Olav Lavik and Poul L. Hornby (Feb PO1:11:2372)
- ENGEL, F. V. A.**
Dsc (Jan HY1:101:2349) of "Design Methods for Flow in Rough Conduits" (July 59 HY7:43:2081)
- ENGLAND, H. B.**
See J. W. Wells (Aug EM4:153:2580)
- EREMIN, A. A.**
Dsc (Feb SM1:89:2391) of "Rock Characteristics of the Paulo Afonso Power Plant" (Aug 59 SM4:95:2137)
Dsc (April ST4:117:2458) of "Laterally Deflected Columns" (Oct 59 ST8:45:2221)
Dsc (May ST5:125:2491) of "Fixed Point Method of Moment Design" (Nov 59 ST9:31:2257)
Dsc (June SM3:101:2538) of "Compaction of Sands and Bearing Capacity of Piles" (Dec 59 SM6:1:2292)
Dsc (July ST7:215:2563) of "Continuous Girder Bridge with Variable Moment of Inertia" (Jan ST1:19:2346)
Dsc (July ST7:217:2563) of "Stability Considerations in the Design of Steel Plate Girders" (Jan ST1:71:2350)
Dsc (Aug SM4:97:2586) of "Dynamic Testing of Pavements" (Feb SM1:1:2368)
Dsc (Oct ST10:151:2635) of "Dynamic Effects of Earthquakes" (April ST4:49:2437)
Dsc (Oct SM5:136:2636) of "Soil Structure and the Step-Strain Phenomenon" (April SM2:1:2431)
Dsc (Dec SM6:101:2696) of "Fundamental Aspects of Thixotropy in Soils" (June SM3:19:2522)

- ERICKSON, L. G.
See W. H. Campen (Dec HW4:40:2694)
- ERLICH, HARRY
See P. H. Mc Gauhey (June 59 IR2:1:2059)
- ESCANDE, L.
Dsc (May HY5:105:2489) of "Hydraulic Analysis of Surge Tanks by Digital Computers" (April 59 HY4:39:1996)
- ESCOBAR-FERNANDEZ, JULIO
Dsc (Mar HY3:63:2426) of "Flood Control Aspects of Cauca Valley Development" (Sept 59 HY9:1:2147)
- ESCOFFIER, F. F.
Dsc (Sept WW3:163:2611) of "Waves in Navigation Canals Due to Lock Filling" (Mar WW1:85:2422)
- ESQUILLAN, NICOLAS
"The Shell Vault of the Exposition Palace, Paris" (Jan ST1:41:2347)
Corr: April ST4:123:2458
- ESTES, H. M.
See O. L. Hooper (April PO2:17:2432)
See W. F. Swiger (Oct 59 SM5:77:2215)
- ESTRADA, ALFRED A.
"Design and Cost Considerations in High Rate Sludge Digestion" (May SA3:111:2479)
Dsc: Samuel A. Greeley, C. Y. Hitchcock, Jr. (Nov SA6:121:2666)
"Regional Planning in Cuyahoga County, Ohio" (May SA3:23:2471)
- EVANS, KARL H.
Dsc (June SM3:91:2538) of "Design of Under-seepage Control Measures for Dams and Levees" (Oct 59 SM5:129:2217)
- EVANS, W. N.
"Construction of Rocky Reach Hydroelectric Project," with J. H. Boyd (Nov CO3:45:2662)
- EYRING, HENRY
See Francis H. Ree (Jan EM1:41:2333)
- FEHRMAN, R. G.
See K. S. Lane (Dec SM6:11:2681)
- FELD, JACOB
Dsc (Dec HW4:39:2694) of "Roadbeds on Highways and Airport Runways" (Mar HW1:1:2412)
- FELT, EARL J.
Dsc (Aug SM4:73:2586) of "A Review and Evaluation of Soil-Cement Pavements" (Dec 59 SM6:49:2294)
- FENVES, STEVEN J.
Dsc (Jan ST1:132:2353) of "Matrix Solution of Beams with Variable Moments of Inertia" (Oct 59 ST8:1:2218)
- FENWICK, GEORGE B.
Dsc (Mar WW1:161:2419) of "An Electric Analog Model of a Tidal Estuary" (Sept 59 WW3:153:2173)
See Eugene P. Fortson, Jr. (June WW2:79:2518)
- FERNANDES, LUIS HENRIQUE GOMES
"Rockfill Dams: The Paradelas Concrete Face Dam," with Edgard de Oliveira and Nuno de Vasconcelos Porto (Aug 58 PO4:1747)
Dsc: J. Barry Cooke (April 59 PO2:93:2013)
Armondo da Palma Carlos (Aug 59 PO4:111:2139)
Clo: June PO3:127:2537
- FERRELL, WILLIAM R., JR.
"Mountain Channel Treatment in Los Angeles County" (Nov 59 HY11:11:2242)
Dsc: George N. Newhall and Frank M. Henry (May HY5:147:2489)
- FIALKOW, M. N.
Dsc (April EM2:187:2455) of "Commentary on Plastic Design in Steel: Additional Design Considerations - I: Progress Report No. 3, Joint WRC-ASCE Committee on Plasticity Related to Design" (Oct 59 EM4:131:2230)
- FILHO, FERNANDO VENANCIO
"Matrix Analysis of Plane Rigid Frames" (July ST7:95:2547)
- FINZI, DANTE
"Underground Power Stations in Italy," with Mario Mainardis and Carlo Semenza (Dec 59 PO6:63:2289)
Dsc: Carlos S. Ospina (April PO2:69:2457)
F. L. Lawton (June PO3:143:2537)
- FISCHERSTROM, N. CLAES H.
"Low Pressure Aeration of Water and Sewage" (Sept SA5:21:2607)
Dsc (Nov HY9:119:2665) of "The Settling Properties of Suspensions" (Dec 59 HY12:9:2311)
- FISHER, GORDON P.
"The Impact of Computers on Engineering Education" (April ST4:1:2428)
Dsc: William A. Boe (Sept ST9:31:2612) Francis E. Swain (Oct ST10:147:2635) Warner Lansing (Nov ST11:159:2667)
See William Mc Guire (June PO3:27:2508)
- FLUCK, PAUL G.
Dsc (Nov ST11:167:2667) of "Design Considerations for Fatigue in Timber Structures" (May ST5:15:2470)
- FOCHT, JOHN A., JR.
Dsc (April SM2:105:2459) of "A Statistical Study of Soil Sampling" (Oct 59 SM5:1:2210)
Dsc (June SM3:59:2538) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)
- FOK, D. Y.
"On the Solution of Rigid Frames by the Column Analogy," with Tung Au (Jan 59 ST1:103:1914)
Clo: Jan ST1:127:2353
- FOLEY, JOSEPH
"Computer Applications in Ground-water Hydrology" (Sept IR3:83:2598)
- FONDAHL, JOHN W.
"Photographic Analysis for Construction Operations" (May CO2:9:2483)
Dsc: Robert F. Borg (Nov CO3:77:2664)
See C. H. Oglesby (Feb 59 CO1:29:1959)

- FOREMAN, ROBERT T.**
 "Static Tension Tests of Compact Bolted Joints," with John L. Rumpf (June ST6:73:2523)
 Corr: Aug ST8:115
- FORSYTHE, S. D.**
 Dsc (Dec HW4:51:2694) of "Developing Alternative Urban Transportation Systems" (Mar HW1:47:2417)
- FORTSON, EUGENE P., JR.**
 "Navigation Model Studies of New Ohio River Locks," with George B. Fenwick (June WW2:79:2518)
- FOSTER, C. R.**
 See W. Heukelom (Feb SM1:1:2368)
- FRADINGER, RAUL E.**
 See John E. Duberg (July ST7:109:2552)
- FRANKLAND, J. M.**
 "Physical Metallurgy and Mechanical Properties of Materials: Ductility and the Strength of Metallic Structures" (Dec EM6:45:2687)
- FRATAR, THOMAS J.**
 "Prediction of Maximum Practical Berth Occupancy," with Alvin S. Goodman and Austin E. Brant, Jr. (June WW2:69:2517)
 Dsc: Donald C. Hill (Nov WW4:117:2659)
- FRAZIER, ARTHUR H.**
 Dsc (July HY7:33:2562) of "Early History of Hydrometry in the United States" (Jan HY1:1:2335)
- FREITAG, DEAN R.**
 See James K. Mitchell (Dec 59 SM6:49:2294)
- FROST, ROBERT E.**
 "Aerial Photography in Arctic and Subarctic Engineering" (May AT1:27:2463)
- FUCIK, E. MONTFORD**
 "Design and Construction of Ambuklao Rockfill Dam," with R. F. Edbrooke (Dec 58 SM5:1864)
 Dsc: F. L. Lawton (Aug 59 SM4:159:2140) Jose O. Lahoz (June SM3:55:2538)
 Clo: Feb SM1:69:2391, June SM3:57:2538
- FUQUAY, D. M.**
 "Generator Technology for Cloud Seeding" (Mar IR1:79:2398)
- GABRIEL, LESTER H.**
 Dsc (July ST7:219:2563) of "Properties of Steel and Concrete and the Behavior of Structures" (Feb ST2:33:2384)
- GAGNON, A. R.**
 See B. Michel (Mar HY3:61:2426)
- GALAMBOS, THEODORE V.**
 "Columns Under Combined Bending and Thrust," with Robert L. Ketter (April 59 EM2:1:1990)
 Dsc: George Winter (Oct 59 EM4:197:2234)
 Clo: April EM2:163:2455
 "Influence of Partial Base Fixity on Frame Stability" (May ST5:85:2480)
 Dsc: Eugene Guillard (Oct ST10:153:2635)
- GALLAWAY, BOB M.**
 Dsc (Dec HW4:59:2694) of "High Temperature Effects on Bituminous Mixes" (Sept HW3:1:2592)
- GALLETLY, GERARD D.**
 Dsc (Feb ST2:77:2390) of "Bending Moments on Shell Boundaries" (Oct 59 ST8:91:2223)
 Dsc (June ST6:151:2539) of "Computer Design of a Multistory Frame Building" (Dec 59 ST10:75:2322)
- GARDE, R. J.**
 Dsc (July HY7:21:2562) of "Discharge Formula for Straight Alluvial Channels" (Nov 59 HY11:65:2260)
- GARDEN, R. J. P.**
 Dsc (Oct EM5:175:2632) of "Commentary on Plastic Design in Steel: Deflections: Progress Report No. 7, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division" (April EM2:141:2454)
- GARDNER, W. H., JR.**
 "Charts for Design of Reinforced Concrete Columns," with Donald H. Kline (May ST5:1:2461)
 Corr: Aug ST8:115
 Dsc: George B. Begg, Jr. (Aug ST8:113:2585) James R. Krusling (Nov ST11:165:2667)
- GARRETT, M. T., JR.**
 Dsc (Nov SA6:89:2666) of "Fundamental Considerations in High - Rate Digestion" (Mar SA2:49:2411)
- GASTON, RICHARD F.**
 See John W. Irvine (May CO2:27:2493)
- GATES, MARVIN**
 "Statistical and Economic Analysis of a Bidding Trend" (Nov CO3:13:2651)
 Dsc (Dec SM6:107:2696) of "Pile-Driving Analysis by the Wave Equation" (Aug SM4:35:2574)
- GERARD, GEORGE**
 "Strength and Efficiency Aspects of Plate Structures" (April EM2:17:2439)
 Dsc: George Pincus and George Winter (Aug EM4:197:2583)
- GERRITSEN, F.**
 See Per Bruun (Dec 59 WW4:75:2301)
- GERSTLE, KURT H.**
 "Flow Graphs in Structural Analysis" (Oct ST10:125:2634)
- GEYER, JOHN C.**
 Dsc (May SA3:169:2490) of "Role of Price in the Allocation of Water Resources" (Jan SA1:15:2343)
 See F. P. Linaweaver, Jr. (Nov HY9:127:2665)
- GILBERT, O. H., JR.**
 Dsc (June SM3:75:2538) of "Rate of Constructing Embankments on Soft Foundation Soils" (Oct 59 SM5:61:2214)
 Dsc (June SM3:81:2538) of "Structure and Strength Characteristics of Compacted Clays" (Oct 59 SM5:87:2216)
- GILLESPIE, JAMES W.**
 "Preliminary Analysis of Continuous Cable Frames," with Jan J. Tuma (April ST4:189:2444)
- GLOGAU, O. A.**
 Dsc (April EM2:172:2455) of "Electrical Analog for Earthquake Yield Spectra" (Oct 59 EM4:43:2197)
 Corr: Oct EM5:185

GLOVER, ROBERT E.

"Drawdown Due to Pumping from an Unconfined Aquifer," with Morton W. Bittinger (Sept IR3:63:2594)

GLOYNA, EARNEST F.

"Sanitary Engineering Aspects of Nuclear Energy: Progress Report, Committee on the Sanitary Engineering Aspects of Nuclear Energy, Sanitary Engineering Division" (May SA3:87:2476)

See Shosei Serata (May SA3:1:2468)

GOLDBERG, JOHN E.

"Buckling of One-Story Frames and Buildings" (Oct ST10:53:2629)

GOLDEN, HAROLD G.

Dsc (Nov HY9:155:2665) of "A Comparison of Stream Velocity Meters" (April HY4:11:2438)

GOLDING, BERNARD L.

"Physical Characteristics of Drainage Basins," with Dana E. Low (Mar HY3:1:2409)
Dsc (April HY4:133:2456) of "New Approach to Local Flood Problems" (Jan HY1:53:2336)
Dsc (Nov HY9:179:2665) of "Hood Inlets for Closed Conduit Spillways" (May HY5:7:2478)

GOMEZ, AMALIO

"Sacramento River Deep Water Ship Channel: Functional Planning" (Nov WW4:53:2649)

GONDIKAS, P.

"Wind Stresses in Domes," with Mario G. Salvadori (Oct EM5:13:2616)

GOODMAN, ALVIN S.

See Thomas J. Fratar (June WW2:69:2517)

GOODMAN, LOUIS J.

Dsc (April SM2:87:2459) with Charles M. Lee of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)

GOODRICH, R. D.

"Tolkmitt's Backwater and Dropdown Curve Tables" (May HY5:1:2469)
Dsc: Ven Te Chow (Aug HY8:73:2587) Praxitelis A. Argyropoulos (Nov HY9:173:2665)

GOTOLSKI, WILLIAM H.

"High Temperature Effects on Bituminous Mixes" (Sept HW3:1:2592)
Dsc: Bob M. Gallaway (Dec HW4:59:2694)
Dsc (Feb SM1:93:2391) of "Rate of Constructing Embankments on Soft Foundation Soils" (Oct 59 SM5:61:2214)

GOUDA, M. A.

"Analysis of Load Distribution in the Piles of Piers" (June WW2:93:2534)
"Hydrodynamic Wave Pressure on Breakwaters" (Mar WW1:13:2414)

GOULD, PHILLIP L.

Dsc (Nov ST11:169:2667) of "Limit Design of Reinforced Concrete Beams" (July ST7:1:2541)

GRAY, D. M.

See H. B. Dickens (Oct SM5:1:2618)

GREELEY, SAMUEL A.

Dsc (Nov HY9:153:2665) of "Conservancy Dis-

tricts as Flood Control Organizations" (April HY4:1:2429)

Dsc (Nov SA6:121:2666) of "Design and Cost Considerations in High Rate Sludge Digestion" (May SA3:111:2479)

GREER, DAVID M.

Dsc (April SM2:84:2459) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)

GRIFFIN, R. L.

See W. C. Simpson (May AT1:57:2466)

GRIFFITH, B. A.

"Evaluation of Alternative Subway Routes," with H. G. von Cube (May CP1:1:2464)

GRISSOM, P. H.

See J. A. Riley (Dec IR4:107:2685)

GROVER, HORACE J.

"Physical Metallurgy and Mechanical Properties of Materials: Fatigue of Structural Materials" (Dec EM6:53:2688)

GROWDON, JAMES P.

"Rockfill Dams: Dams with Sloping Earth Cores" (Aug 58 PO4:1743)
Dsc: Torald Mundal (April 59 PO2:83:2013)
John Lowe, III (Oct PO5:17:2631)
Clo: June PO3:113:2537, Oct PO5:26:2631
"Rockfill Dams: Nantahala Sloping Core Dam" (Aug 58 PO4:1742)
Dsc: F. L. Lawton, Waldo G. Bowman (April 59 PO2:81:2013)
Clo: June PO3:111:2537
"Rockfill Dams: The Performance of Seven Sloping Core Dams" (Aug 58 PO4:1744)
Dsc: F. L. Lawton (April 59 PO2:85:2013)
Clo: June PO3:115:2357

GRUMBLING, JAY S.

See Clair N. Sawyer (Mar SA2:49:2411)

GUILLARD, EUGENE

Dsc (Oct ST10:153:2635) of "Influence of Partial Base Fixity on Frame Stability" (May ST5:65:2480)

GUNNERSON, CHARLES G.

Dsc (April HY4:101:2456) of "Eddy Diffusion in Homogeneous Turbulence" (Sept 59 HY9:75:2150)
Dsc (July HY7:29:2562) of "The Settling Properties of Suspensions" (Dec 59 HY12:9:2311)
See Norman B. Hume (July 59 SA4:71:2089)

GUTZWILLER, M. J.

"Freezing and Thawing Effects on Prestressed Concrete," with F. E. Musleh (Oct ST10:109:2633)

HABER, RICHARD A.

"Correlation of Vehicle Design and Highway Design," with David K. Witheford (June HW2:15:2529)

HAHN, W. J.

See J. R. La Pointe (May SA3:129:2481)

HALL, EDWARD M.

"San Diego Transportation Planning Studies" (Dec 59 CP2:11:2306)
Corr: May CP1:39:2487

HALL, E. J.

Dsc (June HY6:111:2535) of "The Settling Properties of Suspensions" (Dec 59 HY12:9:2311)

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Dsc (June SM3:120:2538) with D. F. Murphy of "Pile Construction in Permafrost" (Dec 59 SM6:75:2295)

HAMMAD, H. Y.

"Seepage Losses from Parallel Canal Systems" (Aug EM4:43:2571)

HAMZAWI, HASHIM H.

Dsc (Oct EM5:171:2632) of "Commentary on Plastic Design in Steel: Connections: Progress Report No. 6, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division" (April EM2:107:2453)

HANSEN, E. A.

"Studies of a Channel Through Padre Island, Texas" (Sept WW3:63:2601)

HANSEN, VAUGHN

See Charles C. Bowman (Jan 59 EM1:67:1898)

HARDER, JAMES A.

See H. A. Einstein (Sept 59 WW3:153:2173)

HARDIN, BOBBY OTT

Dsc (Oct SM5:137:2636) of "Computer Analysis of Slope Stability" (June SM3:1:2501)

HARDING, K. G.

Dsc (Oct ST10:145:2635) with N. S. Trahair of "Italian Arch Dam Design and Model Confirmation" (Mar ST3:1:2410)

HARLAN, R. C.

Dsc (April SM2:85:2459) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)

HARWARD, E. D., JR.

"Accident Preparedness in Reactor Waste Treatment" (July SA4:1:2543)

See J. R. La Pointe (May SA3:129:2481)

HARZA, RICHARD D.

"Design of Karadj Hydroelectric Project," with Robert F. Edbrooke (Aug PO4:31:2579)

HAUSHILD, WILLIAM

"Unsteady Flow of Ground Water into a Surface Reservoir," with Gordon Kruse (July HY7:13:2551)

HAYASHI, KEIICHIRO

Dsc (May ST5:145:2491) of "Continuous Girder Bridge with Variable Moment of Inertia" (Jan ST1:19:2346)

HAYTHORNTHWAITE, R. M.

"Mechanics of the Triaxial Test for Soils" (Oct SM5:35:2625)

HEER, EWALD

See Mario G. Salvadori (Dec ST12:59:2680)

HEGEDUS, ERVIN

"Drag Coefficients of Locomotion over Viscous Soils," with Robert S. Rowe (April SM2:63:2448)

HEINEMANN, HERMAN G.

Dsc (Aug HY8:71:2587) of "Trap Efficiency of Reservoirs, Debris Basins, and Debris Dams" (Feb HY2:69:2374)

HELLER, CHARLES O.

Dsc (Dec 59 ST10:125:2329) of "Analysis of Two-Column Symmetrical Bents" (May 59 ST5:57:2037)

Corr: April ST4:99:2458

HENRY, FRANK M.

See George N. Newhall (May HY5:147:2242)

HERBICH, JOHN B.

Dsc (Jan HY1:115:2349) of "Translations of Foreign Literature on Hydraulics: Progress Report, Task Force on List of Translations, Committee on Hydromechanics, Hydraulics Division" (Aug 59 HY8:1:2126)

HERNANDEZ, JOSÉ

See Ignacio Martin (Jan ST1:1:2344)

HERRMANN, GEORGE

"Vibrations and Stability of Plates under Initial Stress," with Anthony E. Armenakas (June EM3:65:2500)

Dsc: E. F. Masur (Dec EM6:101:2691)

HEUKELOM, W.

"Dynamic Testing of Pavements," with C. R. Foster (Feb SM1:1:2368)

Jsc: R. K. Bernhard, D. F. Coates (June SM3:127,128:2538) A. A. Eremin (Aug SM4:97:2586) O. M. Christof Ehrler (Oct SM5:131:2636)

HICKERSON, T. F.

"Intersection of Straight Line with Spiral" (Feb SU1:61:2379)

Corr: July SU2:47

Dsc: Francis Bates (July SU2:41:2560)

Dsc (July SU2:34:2560) of "Self-Checking Method of Computing Curve Elevations" (Feb SU1:1:2365)

HICKSON, ROBERT S.

Dsc (Nov WW4:109:2659) of "Breakwaters in the Hawaiian Islands" (June WW2:39:2507)

HIGGINS, J. J.

See E. F. Ball (Mar 59 ST3:117:1974)

HILL, DONALD C.

Dsc (Nov WW4:117:2659) of "Prediction of Maximum Practical Berth Occupancy" (June WW2:69:2517)

HILL, H. N.

"Design of Welded Aluminum Structures," with J. W. Clark and R. J. Brungaber (June ST6:101:2528)

See J. W. Clark (July ST7:175:2559)

HINES, LAWRENCE G.

"Role of Price in the Allocation of Water Resources" (Jan SA1:15:2343)

Dsc: John C. Geyer (May SA3:169:2490) Harris F. Seidel (July SA4:97:2561) John A. Logan (Sept SA5:65:2609)

HINO, MIKIO

Dsc (April HY4:95:2456) of "Eddy Diffusion in Homogeneous Turbulence" (Sept 59 HY9:75:2150)

Corr: Aug HY8:78

- HITCHCOCK, C. Y., JR.**
Dsc (Nov SA6:121:2666) of "Design and Cost Considerations in High Rate Sludge Digestion" (May SA3:111:2479)
- HO, HAU-WONG**
See Lucien M. Brush, Jr. (June HY6:109:2535)
- HOGNESTAD, EIVIND**
See C. W. Yu (Dec 58 ST8:1878)
- HOM, O. S.**
See G. S. Sarkaria (Dec 59 PO6:15:2286)
- HOMER, W. A.**
See V. J. Calise (Mar SA2:1:2407)
- HONDROS, G.**
"Load Distribution in Composite Girder-Slab Systems," with J. G. Marsh (Nov ST11:79:2645)
- HOOPER, O. L.**
"Piratinaga Steam-Electric Generating Station," with H. M. Estes (April PO2:17:2432)
Dsc: Adolph J. Ackerman (April PO2:71:2457)
- HOOVER, KENETH M.**
Dsc (Dec HW4:51:2694) of "Developing Alternative Urban Transportation Systems" (Mar HW1:47:2417)
- HORN, JOHN A.**
"Computer Analysis of Slope Stability" (June SM3:1:2501)
Corr: Oct SM5:141
Dsc: Bobby Ott Hardin (Oct SM5:137:2636)
A. L. Little, N. R. Morgenstern, and V. E. Price (Dec SM6:95:2696)
- HORNBY, POUL L.**
See Walter F. Emmons (Feb PO1:11:2372)
- HORONJEFF, R. G.**
See R. W. Smith (Oct 59 AT4:1:2189)
- HOTES, FREDERICK L.**
Dsc (June IR2:93:2536) of "Legal Aspects of Ground Water Utilization" (Dec 59 IR4:41:2283)
- HOUGH, B. K.**
"Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)
Dsc: Michael Praszker, Morris Grosswirth (Dec 59 SM6:163:2325) Ralph B. Peck, Clifton E. R. Lawson, Douglas R. Brown and William M. Crawford, H. O. Ireland, Benjamin Koo, Alfred C. Sheer (Feb SM1:79,80,81,82,84,86:2391) Kurt H. Siecke, David M. Greer, R. C. Harlan, Louis J. Goodman and Charles N. Lee, F. H. Kellogg and E. L. Murphree, Jr., Lev Zetlin, Bramlette Mc Clelland, James Chinn (April SM2:81,84,85 87,90,96,98,101:2459)
Clo: Oct SM5:101:2636
- HOUGH, B. K.**
Dsc (Oct SM5:133:2636) of "Soil Structure and the Step-Strain Phenomenon" (April SM2:1:2431)
- HOUSE, HAZNER ETRIER**
See Arthur Lewis Pollard (Dec 59 PO6:163:2312)
- HOUSNER, G. W.**
"Behavior of Structures During Earthquakes" (Oct 59 EM4:109:2220)
Dsc: Clarence J. Derrick, Glen V. Berg (April EM2:183,185:2455) John A. Blume, Edward Cohen and Samuel Weissman (June EM3:197,201:2532)
Clo: Oct EM5:163:2632
Dsc (Aug ST8:107:2585) of "Dynamic Effects of Earthquakes" (Aug ST8:107:2585)
See T. K. Caughey (April EM2:171:2455)
See D. E. Hudson (Aug EM4:193:2583)
- HOWE, ROBERT T.**
"Polyvinyl Acetate and Portland Cement Mortars" (Feb CO1:31:2358)
Dsc: Clara F. Derrington (Nov CO3:69:2664)
- HOWELL, WALLACE E.**
"Seeding of Clouds in Tropical Climates" (Mar IR1:55:2397)
- HOYT, WILLIAM G.**
Dsc (June HY6:117:2535) of "Early History of Hydrometry in the United States" (Jan HY1:1:2335)
- HRENNIKOFF, A.**
"Lessons of Collapse of Vancouver 2nd Narrows Bridge" (Dec 59 ST10:1:2305)
Dsc: Kuang-Han Chu (May ST5:131:2491) Robert Dannemann (June ST6:145:2539)
Clo: Dec ST12:109:2697
"Shrinkage, Swelling and Creep in Cement" (July 59 EM3:111:2096)
Corr: Aug EM4:201
Dsc: A. M. Neville, Keith Jones (Jan EM1:169, 169:2348)
Clo: Aug EM4:183:2583
- HU, L. W.**
"Design of Circular Plates Based on Plastic Limit Load" (Jan EM1:91:2338)
- HUBER, D. G.**
"Irrotational Motion of Two Fluid Strata Towards a Line Sink" (Aug EM4:71:2573)
- HUBER, WILLIAM G.**
"Rockfill Dams: Kenney and Cheakamus Dams" (June 58 PO3:1671)
Dsc: J. B. Cooke (Aug 59 PO4:93:2139) F. L. Lawton (Oct 59 PO5:139:2238)
Clo: June PO3:103:2537
- HUDSON, D. E.**
Dsc (Aug EM4:193:2583) with G. W. Housner and T. K. Caughey (Aug EM4:193:2583)
See T. K. Caughey (April EM2:171:2455)
- HUDSON, ROBERT Y.**
"Laboratory Investigation of Rubble-Mound Breakwaters" (Sept 59 WW3:93:2171)
Dsc: Jose Reis de Carvalho and Daniel Vera-Cruz, William H. Booth, Jr., Francis B. Slichter, Leland B. Jones (Mar WW1:151,154,156,157:2419) Omar J. Lillevang (June WW2:121:2540) Thorndike Saville, Jr. (Sept WW3:151:2611)
Clo: Sept WW3:156:2611
- HUEY, S. E.**
"Fixed Point Method of Moment Design" (Nov 59 ST9:31:2257)
Dsc: A. A. Eremin (May ST5:125:2491)
- HULL, C. H. J.**
Dsc (July SA4:105:2561) of "Automatic System

- HULL, C. H. J. Continued
for Monitoring Water Quality: Twenty-Eighth Progress Report, Committee on Sanitary Engineering Research, Sanitary Engineering Division" (July SA4:105:2561)
Dsc (Nov SA6:105:2666) of "Oxygen Balance of an Estuary" (May SA3:35:2472)
- HUME, NORMAN B.
"Operation of a 7-Mile Digested Sludge Outfall," with Robert D. Bargman, Charles G. Gunnerson and Charles E. Imel (July 59 SA4:71:2089)
Dsc: C. H. Lawrance and D. R. Miller (Mar SA2:119:2425)
Clo: Sept SA5:59:2609
- HURTY, WALTER C.
"Vibrations of Structural Systems by Component Mode Synthesis" (Aug EM4:51:2572)
- HWANG, SHOI-YEAN
See Hsin-Kuan Liu (Nov 59 HY11:65:2260)
- ICHIYE, TAKASHI
Dsc (April HY4:97:2456) of "Eddy Diffusion in Homogeneous Turbulence" (Sept 59 HY9:75:2150)
- IMEL, CHARLES E.
See Norman B. Hume (July 59 SA4:71:2089)
- INGALLS, GEORGE T.
"Regla Steam Electric Station" (June PO3:89:2520)
- INNIS, HOMER C.
See H. P. Carothers (Sept WW3:103:2603)
- IRELAND, H. O.
Dsc (Feb SM1:82:2391) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)
- IRVINE, JOHN W.
"Concrete Addition to Cellular Sheet Pile Shipway," with Richard F. Gaston (May CO2:27:2493)
- IRVIN, W. F.
"Public Transit Improvements in Toronto" (May CPI:11:2465)
- ISHIHARA, TOJIRO
Dsc (Mar HY3:45:2426) with Yuichi Iwagaki and Yoshiaki Iwasa of "Roll Waves and Slug Flows in Inclined Open Channels" (July 59 HY7:99:2085)
- ISTO, REYNOLD E.
"Topographic Mapping in Alaska" (Feb SU1:119:2386)
- IVES, K. J.
Dsc (July SA4:101:2561) of "Russian Water Supply and Treatment Practices" (Mar SA2:1:2407)
- IWAGAKI, YUICHI
See Tojiro Ishihara (Mar HY3:45:2426)
- IWASA, YOSHIAKI
See Tojiro Ishihara (Mar HY3:45:2426)
- JENKINS, JOHN E.
"Sedimentation in Reservoirs in the Southeast," with Charles E. Moak and Daniel A. Okun (July SA4:55:2557)
- JOGLEKAR, D. V.
Dsc (Nov HY9:129:2665) of "Scour at Bridge Crossing" (Feb HY2:39:2369)
- JOHNSON, CHARLES A.
See Alan D. K. Laird (Nov HY9:43:2652)
- JOHNSON, DONALD E.
"Lateral Stability of Frames by Energy Method" (Aug EM4:23:2567)
- JOHNSON, J. W.
"The Supply and Loss of Sand to the Coast" (Sept 59 WW3:227:2177)
Dsc: P. S. Eagleson and R. G. Dean (June WW2:125:2540)
Dsc (April HY4:131:2456) of "Early History of Hydrometry in the United States" (Jan HY1:1:2335)
- JOHNSON, LAWRENCE P., JR.
"Elasti-Plastic Analysis of Continuous Frames and Beams," with Herbert A. Sawyer, Jr. (Dec 58 ST8:1879)
Dsc: Giuliano Augusti, Tullio Renzulli, Emilio Rosenblueth, A. A. Eremin (June 59 ST6:71,74,77,81:2075)
Clo: Oct ST10:141:2635
- JOHNSON, OLIVER A.
"Application of Snow Hydrology to the Columbia Basin," with Peter B. Boyer (Jan 59 HY1:61:1904)
Dsc: David H. Miller (Aug 59 HY8:109:2138)
Clo: Feb HY2:105:2381
- JOHNSTON, BRUCE G.
"Digest of the Guide to Design Criteria for Metal Compression Members" (April ST4:157:2450)
Dsc: H. J. Pian (July ST7:221:2563)
"Summary of the Activities of the Column Research Council" (Jan ST1:13:2345)
- JOHNSTON, G. H.
Dsc (June SM3:63:2538) of "Subsurface Explorations in Permafrost Areas" (Oct 59 SM5:34:2212)
- JONES, KEITH
Dsc (Jan EM1:169:2348) of "Shrinkage, Swelling and Creep in Cement" (July 59 EM3:111:2096)
- JONES, LELAND B.
Dsc (Mar WW1:157:2419) of "Laboratory Investigation of Rubble-Mound Breakwaters" (Sept 59 WW3:93:2171)
- JOOSTING, W. C. Q.
Dsc (June WW2:133:2540) of "A Case of Critical Surging of a Moored Ship" (Dec 59 WW4:157:2318)
- JORDAAN, J. M., JR.
Dsc (Sept SA5:87:2609) of "Diffusers for Disposal of Sewage in Sea Water" (Mar SA2:65:2424)
Dsc (Sept WW3:176:2611) of "Mean Direction of Waves and of Wave Energy" (Mar WW1:123:2423)
Dsc (Nov SA6:87:2666) of "Diffusion in a Sectionally Homogeneous Estuary" (Mar SA2:15:2408)

- JORDAN, PAUL R.
See Don M. Culbertson (May HY5:171:2489)
- JULIAN, OLIVER G.
Dsc (Aug ST8:97:2585) of "Properties of Steel and Concrete and the Behavior of Structures" (Feb ST2:33:2384)
- JURKOVICH, W. J.
Dsc (Sept ST9:33:2612) of "Review of Research on Composite Steel-Concrete Beams" (June ST6:1:2496)
- KANAREK, NAT T.
"Cut-Off Points for Cover Plates" (Dec 59 ST10:21:2308)
Corr: Feb ST2:81:2390
Dsc: Nabi Taskinoglu (May ST5:133:2491)
- KANTEY, B. A.
Dsc (June SM3:98:2358) of "Compaction of Sands and Bearing Capacity of Piles" (Dec 59 SM6:1:2292)
- KAPERNICK, J. W.
See L. D. Childs (Oct 58 HW3:1800)
- KASER, ROLLAND F.
Dsc (May HY5:189:2489) of "Trap Efficiency of Reservoirs, Debris Basins, and Debris Dams" (Feb HY2:69:2374)
- KASHIN, SEYMOUR
Dsc (Sept HW3:71:2614) of "Passenger Data for Urban Transportation Planning" (Dec 59 HW4:37:2275)
- KASSANDER, A. RICHARD, JR.
See Louis J. Battan (Mar IR1:17:2394)
- KATTERHENRY, ARNOLD A.
"Highway and Bridge Surveys: Analytic Geometry in Highway Design and Layout: Progress Report, Committee on Engineering Surveys, Surveying and Mapping Division" (July SU2:1:2548)
- KAUFMAN, R. I.
See C. I. Mansur (SM6:35:2683)
- KAUFMAN, STEPHEN A.
"Planning Activity in the Cleveland Region" (May CPI:23:2492)
- KAUFMAN, W. J.
"Tritium as a Ground Water Tracer" (Nov SA6:47:2660)
- KAVANAGH, THOMAS C.
"Effective Length of Framed Columns" (Feb ST2:1:2363)
- KAZMANN, RAPHAEL G.
Dsc (Jan HY1:99:2349) of "An Engineering Appraisal of Hydrologic Data: Progress Report, Task Group of Hydrologic Data, Committee on Hydrology, Hydraulics Division" (July 59 HY7:1:2079)
Dsc (June IR2:91:2536) of "Legal Aspects of Ground Water Utilization" (Dec 59 IR4:41:2283)
- KEEFER, C. E.
Dsc (Sept SA5:83:2609) of "Fundamental Considerations in High-Rate Digestion" (Mar SA2:49:2411)
- KEENE, PHILIP
Dsc (Feb SM1:71:2391) of "A Review of the Engineering Characteristics of Peat" (Feb 59 SM1:21:1937)
- KEENER, KENNETH B.
Dsc (Feb PO1:99:2392) of "U.S.B.R. Practices for Control of Cracking in Arch Dams" (Aug 59 PO4:1:2130)
- KEESE, CHARLES J.
See Charles Pinnell (Sept HW3:41:2604)
- KEIFER, CLINT J.
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- KELLER, F. G.
"Self-Checking General Analysis of Rigid Frames with Sway" (Feb 59 ST2:107:1943)
Corr: Sept 59 ST7:155:2186
Dsc: J. J. Polivka
Clo: Mar ST3:31:2427
- KELLER, JACK
"Laboratory Research on Interceptor Drains," with A. R. Robinson (Sept 59 IR3:25:2154)
Dsc: M. Maasland (Dec 59 IR4:101:2327)
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Clo: Sept IR3:113:2613
- KELLOGG, F. H.
Dsc (April SM2:90:2459) with E. L. Murphree, Jr. of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)
- KENNEDY, JOHN F.
See R. Hugh Taylor (Feb HY2:115:2381)
- KENNISON, HUGH F.
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- KENT, RICHARD
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Dsc: M. B. McPherson (Sept SA5:69:2609)
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- KETTER, ROBERT L.
See Theodore V. Galambos (April 59 EM2:1:1990)
- KHACHATURIAN, NARBEY
Dsc (May ST5:152:2491) of "Continuous Girder Bridge with Variable Moment of Inertia" (Jan ST1:19:2346)
See John E. Duberg (July ST7:109:2552)
- KING, ALBERT L.
"Drainage, A Vital Need in Irrigated Humid Areas" (Dec IR4:81:2676)
- KING, ELWYN H.
Dsc (June ST6:139:2539) of "Analysis of Rigid Frames by Electronic Computation" (Nov 59 ST9:65:2259)
- KIRPICH, PHILIP Z.
"Flood Control Aspects of Cauca Valley Development," with Carlos S. Ospina (Sept 59 HY9:1:2147)
Dsc: Gordon R. Williams (Feb HY2:123:2381)
Julio Escobar-Fernandez (Mar HY3:63:2426)

- KLINE, DONALD H.
See W. H. Gardner, Jr. (May ST5:1:2461)
- KOCH, G. ROBERT
Dsc (Oct PO5:13:2631) of "Rockfill Dams: Review and Statistics" (Aug 58 PO4:1739)
- KOHL, H. ROBERT
See John B. Nesbitt (Jan SA1:1:2341)
- KOHL, JOHN C.
Dsc (June HW2:51:2533) of "Passenger Data for Urban Transportation Planning" (Dec 59 HW4:37:2275)
- KOHLER, WARREN H.
Dsc (April HY4:124:2456) of "Hydraulic Characteristics of Gate Slots" (Oct 59 HY10:81:2224)
- KOLF, R. C.
"The Vortex Chamber as an Automatic Flow-Control Device," with P. B. Zielinski (Dec 59 HY12:1:2310)
Dsc: Michael Amein (Mar HY3:85:2426) John C. Stevens (June HY6:107:2535)
- KOLUPAILA, STEPONAS
"Early History of Hydrometry in the United States" (Jan HY1:1:2335)
Dsc: J. W. Johnson (April HY4:131:2456) William G. Hoyt, E. Shaw Cole (June HY6:117, 118:2535) Murray Blanchard, Arthur H. Frazier, J. C. Stevens (July HY7:33,35:2562) Ivan J. Moskvitnoff (Nov HY9:125:2665)
Dsc (Mar HY3:75:2426) of "Revised Computation of a Velocity Head Weighted Value" (Sept 59 HY9:69:2149)
- KOO, BENJAMIN
Dsc (Feb SM1:84:2391) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)
Dsc (April ST4:117:2458) of "Laterally Deflected Columns" (Oct 59 ST8:45:2221)
- KOVNER, J. L.
Dsc (Aug HY8:67:2587) of "Hydrologic Studies by Electronic Computers in TVA" (Feb HY2:1:2362)
- KRAMER, J. M.
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- KRIZ, LADISLAV B.
"Ultimate Strength of Over-Reinforced Beams," with Seng-Lip Lee (June EM3:95:2502)
Dsc: Iqbal Ali (Dec EM6:107:2691)
- KRUSE, E. G.
Dsc (June HY6:103:2535) of "Effect of Aquifer Turbulence on Well Drawdown" (Nov 59 HY11:99:2265)
- KRUSE, GORDON
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- KRUSLING, JAMES R.
Dsc (Nov ST11:165:2667) of "Charts for Design of Reinforced Concrete Columns" (May ST5:1:2461)
- KUIPER, E.
"Sediment Transport and Delta Formation" (Feb HY2:55:2371)
- LACEY, GERALD
Dsc (July HY7:49:2562) of "The Fourth Root n-f Diagram" (Jan HY1:63:2340)
- LAHOZ, JOSE O.
Dsc (June SM3:55:2538) of "Design and Construction of Ambuklao Rockfill Dam" (Dec 58 SM5:1864)
- LAIRD, ALAN D. K.
"Water Eddy Forces on Oscillating Cylinders," with Charles A. Johnson and Robert W. Walker (Nov HY9:43:2652)
- LAMBE, T. WILLIAM
"Physico-Chemical Properties of Soils: Role of Soil Technology" (April 59 SM2:55:2001)
Dsc: A. A. Eremin (Oct 59 SM5:179:2236)
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- LAMONT, CHARLES M.
"Self-Checking Method of Computing Curve Elevations" (Feb SU1:1:2365)
Dsc: T. F. Hickerson (July SU2:34:2560)
- LANE, K. S.
"Tuttle Creek Dam of Rolled Shale and Dredged Sand," with R. G. Fehrman (Dec SM6:11:2681)
- LANGE, G. ROBERT
Dsc (June SM3:65:2538) of "Subsurface Explorations in Permafrost Areas" (Oct 59 SM5:31:2212)
- LANNER, VILGOT
Dsc (April PO2:41:2457) of "Rockfill Dams: Brownlee Sloping Core Dam" (Aug 58 PO4:1734)
- LANSING, WARNER
Dsc (Nov ST11:159:2667) of "The Impact of Computers on Engineering Education" (April ST4:1:2428)
- LA POINTE, J. R.
"Waste Treatment at the Shippingport Reactor," with W. J. Hahn and E. D. Harward, Jr. (May SA3:129:2481)
- LARA, JOE M.
"Revised Computation of a Velocity Head Weighted Value," with K. B. Schroeder (Sept 59 HY9:69:2149)
Dsc: Manuel A. Benson, Marcel Bitoun (Feb HY2:127,129:2381) Steponas Kolupaila, Israel H. Steinberg, William C. Peterson (Mar HY3:75,77:2426)
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Dsc: Bernard L. Golding (June HY6:79:2076) T. R. Anand (Aug 59 HY8:123:2138) R. Silvester (Sept 59 HY9:163:2182) William C. Peterson (Nov 59 HY11:137:2269) S. V. Chitale and K. Arunachalam, F. Paderi (Aug HY8:41:47:2587)
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- LARSEN, IAN
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- LARSEN, WESLEY R.
See Thomas H. Thornburn (Oct 59 SM5:1:2210)
- LARSON, MARVIN A.
Dsc (Oct ST10:155:2635) of "Various Instability

- LARSON, MARVIN A. Continued
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- LAURSEN, EMMETT M.
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Corr: June HY6:121
Dsc: T. Blench (May HY5:193:2489) Joseph N. Bradley (Aug HY8:59:2587) D. V. Joglekar, W. J. Bauer, L. J. Tison, S. V. Chitale, A. Rylands Thomas, Mushtaq Ahmad, Pier Luigi Romita (Nov HY9:129,132,134,137,142,144,151:2665)
- LAVIK, OLAV
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- LAWRANCE, C. H.
Dsc (Mar SA2:119:2425) with D. R. Miller of "Operation of a 7-Mile Digested Sludge Outfall" (July 59 SA4:71:2089)
Dsc (Sept SA5:87:2609) of "Diffusers for Disposal of Sewage in Sea Water" (Mar SA2:65:2424)
- LAWSON, CLIFTON E. R.
Dsc (Feb SM1:80:2391) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)
- LAWTON, F. L.
Dsc (June PO3:151:2537) of "An Unusual Deposit in a Hydraulic Tunnel" (Dec 59 PO6:163:2312)
Dsc (June PO3:143:2537) of "Underground Power Stations in Italy" (Dec 59 PO6:63:2289)
- LEAN, G. H.
Dsc (May HY5:167:2469) of "Discharge Formula for Straight Alluvial Channels" (Nov 59 HY11:65:2260)
- LEDBETTER, WILLIAM B.
See Benjamin F. McCullough (Dec HW4:1:2677)
- LEE, CHARLES N.
See Louis J. Goodman (April SM2:87:2459)
- LEE, DONOVAN
Dsc (Oct ST10:161:2635) of "Basic Column Strength" (July ST7:139:2555)
- LEE, SENG-LIP
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- LEE, S. L.
"Bar-Chain Method for Analyzing Truss Deformation," with P. C. Patel (May ST5:69:2477)
"Vierendeel Bents with Nonprismatic Members," with F. P. Weisinger (Dec 59 ST10:55:2321)
Dsc: Paul Rogers (May ST5:139:2491)
- LEISCH, JACK E.
"Spacing of Interchanges on Freeways in Urban Areas" (Dec 59 HW4:61:2277)
Dsc: Gerald D. Love (June HW2:59:2533)
- LEMCOE, M. M.
"Stresses in Layered Elastic Solids" (Aug EM4:1:2565)
- LE MÉHAUTÉ, BERNARD
"Periodical Gravity Wave on a Discontinuity" (Nov HY9:11:2646)
- LEONTOVICH, VALERIAN
Dsc (Aug ST8:93:2585) of "Continuous Girder Bridge with Variable Moment of Inertia" (Jan ST1:19:2346)
- LEUTHEUSSER, H. J.
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- LEWIS, HAROLD M.
"Freeways in Urban Planning" (June 59 CP1:37:2055)
Dsc: R. A. Haber and W. J. Miller, Jr., George H. Herrold (Dec 59 CP2:55,57:2324)
Clo: May CP1:35:2487
Dsc (June HW2:52:2533) of "Passenger Data for Urban Transportation Planning" (Dec 59 HW4:37:2275)
- LEWIS, M. R.
"Heritage of Irrigation in Iraq" (June IR2:9:2495)
- LEWIS, WAYNE C.
"Design Considerations for Fatigue in Timber Structures" (May ST5:15:2470)
Dsc: Paul G. Fluck, Floyd E. Schneider (Nov ST11:167:2667)
- LI, C. Y.
"Construction Pore Pressures in an Earth Dam" (Oct 59 SM5:43:2213)
Dsc: P. J. Moore, Gideon Yachin (April SM2:107,109:2459)
Clo: Oct SM5:127:2636
- LIBBY, JAMES W.
"Furnas Hydroelectric Project" (April PO2:1:2430)
- LIEBLEIN, J.
Dsc (Nov ST11:161:2667) of "Distributions of Extreme Winds in the United States" (April ST4:11:2433)
- LILLEVANG, OMAR J.
"Mean Direction of Waves and of Wave Energy" (Mar WW1:123:2423)
Dsc: J. W. Dunham, Per Bruun, J. M. Jordaan, Jr. (Sept WW3:173,175,176:2611)
Dsc (June WW2:121:2540) of "Laboratory Investigation of Rubble-Mound Breakwaters" (Sept 59 WW3:93:2171)
- LINAWEAVER, F. P., JR.
Dsc (Nov HY9:127:2665) with John C. Geyer and Jerome B. Wolff of "Generalized Distribution Network Head Loss Characteristics" (Jan HY1:75:2339)
- LINELL, K. A.
Dsc (Aug SM4:95:2586) of "Permafrost Aspects of Hudson Bay Railroad" (Dec 59 SM6:125:2319)
- LITTLE, A. L.
Dsc (Dec SM6:95:2696) with N. R. Morgenstern and V. E. Price of "Computer Analysis of Slope Stability" (June SM3:1:2501)
- LIU, HSIN-KUAN
"Discharge Formula for Straight Alluvial Channels," with Shoi-Yean Hwang (Nov 59 HY11:65:2260)
Dsc: T. Blench (Feb HY2:131:2381) G. H. Lean, Lucien M. Brush, Jr., Don M. Culbertson and

- LIU, HSIN-KUAN Continued
 Paul R. Jordan, Bruce R. Colby (May HY5:167, 168,171,174:2489) C. Blanchet, D. R. Dawdy and R. W. Carter, M. Gamal Mostafa, James K. Culbertson and Carl F. Nordin, Jr. (June HY6:91,93, 96,98:2535) R. J. Garde, John L. Bogardi (July HY7:21,26:2562)
- LIVINGSTON, CLIFTON W.
 "Fundamentals of Arctic Blasting" (Feb CO1:1: 2355)
- LOBDELL, HERBERT L.
 "Rate of Constructing Embankments on Soft Foundation Soils" (Oct 59 SM5:61:2214)
 Dsc: W. H. Gotolski (Feb SM1:93:2391) Harry R. Cedergren, F. P. Silva, O. H. Gilbert, Jr. (June SM3:69,72,75:2538)
- LOGAN, JOHN A.
 Dsc (Sept SA5:65:2609) of "Role of Price in the Allocation of Water Resources" (Jan SA1:15:2343)
- LOMAX, CLAUD C.
 Dsc (July HY7:43:2562) of "Generalized Distribution Network Head Loss Characteristics" (Jan HY1:75:2339)
- LONG, WILLIAM F.
 Dsc (June IR2:69:2536) of "Laboratory Research on Interceptor Drains" (Sept 59 IR3:25:2154)
- LOUNT, A. M.
 "Computer Design of a Multistory Frame Building" (Dec 59 ST10:75:2322)
 Dsc: D. M. Brotton, G. D. Galletly (June ST6: 149,151:2539)
- LOVE, GERALD D.
 Dsc (June HW2:59:2533) of "Spacing of Interchanges on Freeways in Urban Areas" (Dec 59 HW4:61:2277)
- LOVELACE, ELDRIDGE H.
 "Coordinating Public Works and Urban Renewal in Kansas City, Kan.," with Ramon Duran (Dec 59 CP2:29:2307)
 Dsc: Charles E. Doell (May CP1:41:2487)
- LOW, DANA E.
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- LOW, GEORGE J.
 "Soil Freezing to Reconstruct a Railway Tunnel" (Nov CO3:1:2639)
- LOW, W. I.
 Dsc (June SM3:106:2538) of "Compaction of Sands and Bearing Capacity of Piles" (Dec 59 SM6:1:2292)
- LOWE, JOHN, III
 Dsc (Oct PO5:26:2631) of "Rockfill Dams: Dams with Sloping Earth Cores" (Aug 58 PO4:1743)
- LYNCH, T. J.
 "Pile Driving Experiences at Port Everglades" (April SM2:41:2442)
- MAC FARLANE, IVAN C.
 "A Review of the Engineering Characteristics of Peat" (Feb 59 SM1:21:1937)
 Dsc: T. Cameron Kenney, E. J. Zegarra (June 59 SM3:89:2077) Philip Keene (Feb SM1:71:2391)
 Clo: Oct SM5:97:2636
- MACHTA, L.
 "Radioactive Tracers in Hydrometeorology" (April HY4:49:2451)
- MAC LEAN, D. J.
 Dsc (June SM3:115:2538) with K. E. Clare of "A Review and Evaluation of Soil-Cement Pavements" (Dec 59 SM6:49:2294)
- MAC NEAL, RICHARD H.
 "Arch Dam Analysis with an Electric Analog Computer" (Aug EM4:127:2578)
- MAIER, JOSEPH W.
 Dsc (July HY7:44:2562) with Thomas C. Miller of "Generalized Distribution Network Head Loss Characteristics" (Jan HY1:75:2339)
- MAINARDIS, MARIO
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- MALTER, HENRY
 "Numerical Solutions for Interconnected Bridge Girders" (Oct 58 ST6:1815)
 Clo: Jan ST1:123:2353
- MANNING, JOHN J.
 "Simple Rules for Hot or Cold Weather Concrete" (Nov CO3:37:2661)
- MANNING, W. F.
 Dsc (Mar WW1:163:2419) of "A Breasting Dolphin for Berthing Supertankers" (Sept 59 WW3: 183:2175)
- MANSUR, C. I.
 "Dewatering the Port Allen Lock Excavation," with R. I. Kaufman (Dec SM6:35:2683)
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- MANTEY, R. F.
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- MARSH, J. G.
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- MARTIN, IGNACIO
 "Orthogonal Gridworks Loaded Normally to their Planes," with José Hernandez (Jan ST1:1: 2344)
 Corr: Sept ST9:35
 Dsc: Ming L. Pei (Aug ST8:1:2585)
- MASCH, FRANK D., JR.
 "Drag Forces in Velocity Gradient Flow," with Walter L. Moore (July HY7:1:2546)
 Dsc (April SM2:79:2459) of "Tractive Resistance of Cohesive Channels" (June 59 SM3:1:2062)
- MASE, GEORGE E.
 "Behavior of Viscoelastic Plates in Bending" (June EM3:25:2498)
 Dsc: O. C. Zienkiewicz (Oct EM5:181:2632)
- MASSONNET, CHARLES
 "Stability Considerations in the Design of Steel Columns" (Sept 59 ST7:75:2163)
 Dsc: A. A. Eremin, Theodore V. Galambos (Mar ST3:37:2427)
 Clo: Dec ST12:107:2697
- MASSONNET, CHARLES E. L.
 "Stability Considerations in the Design of Steel Plate Girders" (Jan ST1:71:2350)

- MASSONNET, CHARLES E. L.** Continued
Corr: April ST4:125:2458
Dsc: A. A. Eremin (July ST7:217:2563)
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- MASUR, E. F.**
Dsc (Dec EM6:101:2691) of "Vibrations and Stability of Plates under Initial Stress" (June EM3:65:2500)
- MATHER, BRYANT**
Dsc (April PO2:57:2457) of "Control of Cracking in Concrete Gravity Dams" (Oct 59 PO5:1:2206)
- MATLOCK, HUDSON**
"Generalized Solutions for Laterally Loaded Piles," with Lymon C. Reese (Oct SM5:63:2626)
- MAYER, PAUL G.**
"Roll Waves and Slug Flows in Inclined Open Channels" (July 59 HY7:99:2085)
Dsc: F. F. Escoffier (Dec 59 HY12:125:2271)
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- MAYO, KENNETH B.**
See Joseph I. Burns (Nov WW4:33:2648)
- MERZ, ROBERT C.**
"Waste Water Reclamation for Golf Course Irrigation" (Nov 59 SA6:79:2252)
Dsc: Ralph Stone (Mar SA2:107:2425) Garrett Sloan (May SA3:167:2490)
- METCALF, LAURENCE P.**
See Marvin J. Webster (Sept 59 HY9:69:2148)
- MEYERHOF, C. G.**
"Bearing Capacity of Floating Ice Sheets" (Oct EM5:113:2627)
"Compaction of Sands and Bearing Capacity of Piles" (Dec 59 SM6:1:2292)
Dsc: S. C. Schiff, Charles Szechy, B. A. Kantey, A. A. Eremin, Yoshichika Nishida, W. I. Low (June SM3:95,96,101,102,108:2538)
Clo: Oct SM5:129:2636
- MEYERS, Carl F.**
Dsc (Feb SU1:101:2385) of "Status of Surveying and Mapping in the United States: Final Report, Task Committee on Status of Surveying and Mapping, Surveying and Mapping Division" (Sept 59 SU1:9:2166)
- MICHALOS, JAMES**
"Movements of a Cable Due to Changes in Loading," with Charles Birnstiel (Dec ST12:23:2674)
- MICHEL, B.**
Dsc (Mar HY3:61:2426) with A. R. Gagnon of "Spillway Design for Pacific Northwest Projects" (Aug 59 HY8:63:2129)
- MILES, T. K.**
See W. C. Simpson (May AT1:57:2466)
- MILLER, CARL R.**
See Whitney M. Borland (April HY4:61:2452)
- MILLER, D. R.**
See C. H. Lawrance (Mar SA2:119:2425)
- MILLER, ROBERT L.**
Dsc (May HY5:129:2489) of "Wave-Induced Motion of Bottom Sediment Particles" (Oct 59 HY10:53:2202)
- MILLER, THOMAS C.**
See Joseph W. Maier (July HY7:44:2562)
- MINSHALL, NEAL E.**
"Predicting Storm Runoff on Small Experimental Watersheds" (Aug HY8:17:2577)
Dsc (June IR2:65:2536) with D. A. Woolhiser of "Annual Droughts" (Sept 59 IR3:15:2153)
- MITCHELL, DESSO T.**
Dsc (May SA3:165:2490) of "Refuse Volume Reduction in a Sanitary Landfill: Twenty-sixth Progress Report, Committee on Sanitary Engineering, Sanitary Engineering Division" (Nov 59 SA6:37:2250)
- MITCHELL, JAMES K.**
"Fundamental Aspects of Thixotropy in Soils" (June SM3:19:2522)
Dsc: P. L. Newland and B. H. Allely, A. A. Eremin (Dec SM6:99,101:2696)
"A Review and Evaluation of Soil-Cement Pavements," with Dean R. Freitag (Dec 59 SM6:49:2294)
Dsc: Miles D. Catton, D. J. MacLean and K. E. Clare (June SM3:113,115:2538) Ernest Zube, Earl J. Felt (Aug SM4:73,75:2586)
- MOAK, CHARLES E.**
See John E. Jenkins (July SA4:55:2557)
- MOGG, JOE L.**
"Effect of Aquifer Turbulence on Well Drawdown" (Nov 59 HY11:99:2265)
Dsc: J. R. Philip (May HY5:179:2489) E. G. Kruse (June HY6:103:2535)
- MOHANTY, P. K.**
See Dean F. Peterson (Nov HY9:55:2653)
- MOONEY, WILLIAM G.**
See Robert M. Barnoff (April ST4:25:2436)
- MOORE, CHARLIE M.**
"Performance of Flood Prevention Works During the 1957 Floods" (Oct 59 HY10:37:2201)
Dsc: Fred W. Blaisdell (Mar HY3:81:2426)
"Trap Efficiency of Reservoirs, Debris Basins, and Debris Dams," with Walter J. Wood and Graham W. Renfro (Feb HY2:69:2374)
Dsc: Rolland F. Kaser (May HY5:189:2489) Herman G. Heinemann (Aug HY8:71:2587)
- MOORE, P. J.**
Dsc (April SM2:107:2459) of "Construction Pore Pressures in an Earth Dam" (Oct 59 SM5:43:2213)
- MOORE, WALTER L.**
"Relationships Between Pipe Resistance Formulas" (Mar 59 HY3:25:1962)
Dsc: Peter Ackers (July 59 HY7:155:2097) K. Szesztay, Henry J. Miles, M. B. McPherson, Nicholas Bilonok, J. V. Dawsey (Sept 59 HY9:137,141,143,155,157:2182)
Clo: Mar HY3:37:2426
See Frank D. Masch (July HY7:1:2546)

- MORGENSTERN, N. R.
See A. L. Little (Dec SM6:95:2696)
- MORRIS, HENRY W.
"Design Methods for Flow in Rough Conduits"
(July 59 HY7:43:2081)
Dsc: F. V. A. Engel, P. Ackers, Nicholas Bilonok, John A. Roberson (Jan HY1:101,106,109,111:2349)
- MORRIS, MORTON D.
"Field Office Bookshelf: Progress Report, Committee on Publications, Construction Division"
(Feb CO1:27:2357)
- MORRIS, ROBERT L.
Dsc (Dec HW4:55:2694) of "Analyzing and Projecting Travel Data" (June HY2:1:2513)
- MORRIS, SAMUEL B.
"Los Angeles Water Supply and Irrigation"
(Dec IR4:35:2671)
- MORSE, STANLEY
"Geometry of Moiré Fringes in Strain Analysis," with August J. Durelli and Cesar A. Sciammarella (Aug EM4:105:2576)
- MOSTAFA, M. GAMAL
Dsc (June HY6:96:2535) of "Discharge Formula for Straight Alluvial Channels" (Nov 59 HY11:65:2260)
- MUIR, J. F.
"Passage of Young Fish through Turbines"
(Feb 59 PO1:23:1947)
Dsc: W. S. McIlquham, G. Dugan Johnson (Oct 59 PO5:153,154:2238)
Clo: Feb PO1:95:2392
- MULLIS, IRA B.
"Roadbeds on Highways and Airport Runways"
(Mar HW1:1:2412)
Dsc: Jacob Feld, W. H. Campen, L. G. Erickson, and J. R. Smith (Dec HW4:39,40:2694)
- MUNDAL, TORALD
"Rockfill Dams: Brownlee Sloping Core Dam"
(Aug 58 PO4:1734)
Dsc: George K. Leonard (Feb 59 PO1:159:1953)
F. L. Lawton, Hual-yun Hsu, Reifo Ito (April 59 PO2:31,32,36:2013) G. H. Condit (Dec 59 PO6:191:2328) Vilgot Lanner (April PO2:41:2457)
J. B. Cooke (Oct PO5:3:2631)
Clo: April PO2:51:2457; Oct PO5:9:2631
- MUNSE, W. H.
"Strength of Rivets and Bolts in Tension," with K. S. Petersen and E. Chesson, Jr. (Mar 59 ST3:7:1970)
Dsc: Richard T. Douty (Sept 59 ST7:161:2186)
W. R. Penman and E. F. Ball (Oct 59 ST8:157:2237)
Clo: April ST4:97:2458
Dsc (April ST4:119:2458) of "Theory and Test Results on the Fatigue of Metals" (Oct 59 ST8:65:2222)
- MUNSON, WENDELL C.
"Method for Estimating Consumptive Use of Water for Agriculture" (Dec IR4:45:2672)
- MURPHREE, E. L., JR.
See F. H. Kellogg (April SM2:90:2459)
- MURPHY, GLENN
"Physical Metallurgy and Mechanical Properties of Materials: Metallurgical Advances and Civil Engineering" (Dec EM6:65:2689)
- MURPHY, H. L.
"Blast Loading on Structures" (Nov 58 ST7:1837)
Clo: Jan ST1:125:2353
- MURPHY, M. J.
See G. N. Bycroft (Oct 59 EM4:43:2197)
- MURPHY, R. S.
"Activated Carbon Removal of Hydrogen Sulfide," with I. W. Santry, Jr. (Nov SA6:1:2641)
- MUSLEH, F. E.
See M. J. Gutzwiller (Oct ST10:109:2633)
- MUSS, DAVID L.
"Friction Losses in Lines with Service Connections" (April HY4:35:2449)
Dsc: M. H. Diskin, Annabel L. Tong, M. B. McPherson and J. V. Radziul, K. M. Yao (Nov HY9:157,159,161,167:2665)
- MCCARTHY, R. E.
See E. P. Popov (Jan EM1:61:2334)
- MCCASLAND, S. P.
"Hydroelectric Possibilities and Influence of Load Growth" (April PO2:29:2435)
- MCCLELLAND, BRAMLETTE
Dsc (April SM2:98:2459) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)
- MCCONOCHE, WILLIAM R.
"Developing Alternative Urban Transportation Systems" (Mar HW1:47:2417)
Dsc: Kenneth M. Hoover, S. D. Forsythe, Nathan Cherniack (Dec HW4:51,52:2694)
Dsc (June HW2:51:2533) of "Passenger Data for Urban Transportation" (Dec 59 HW4:37:2275)
- McCULLOUGH, BENJAMIN F.
"LTS Design of Continuously Reinforced Concrete Pavement," with William B. Ledbetter (Dec HW4:1:2677)
- MCDONALD, H. R.
"Geophysical Procedures in Ground Water Study," with Dart Wantland (Sept IR3:13:2589)
- McGAUHEY, P. H.
"Economic Evaluation of Water," with Harry Erlich (June 59 IR2:1:2059)
Dsc: M. R. Lewis, Robert O. Thomas, R. H. Brooks (Dec 59 IR4:89,91,94)
Clo: June IR2:61:2536)
- MCGUIRE, WILLIAM
"Containment Studies for an Atomic Power Plant," with Gordon P. Fisher (June PO3:27:2508)
- McINNIS, BAYLISS C.
Dsc (April EM2:179:2455) with Steven Likuan Tsai and James R. Sims of "Laterally Loaded Thin Flat Plates" (Oct 59 EM4:77:2199)

McKEE, KEITH E.

See Ernest T. Seilig (Aug EM4:87:2575)

McKEOWN, JAMES J.

Dsc (Jan SA1:37:2352) with Daniel A. Okun of "Absorption of Oxygen from Air Bubbles" (July 59 SA4:89:2090)

McLAUGHLIN, RONALD T., JR.

"The Settling Properties of Suspensions" (Dec 59 HY12:9:2311)

Dsc: Lucien M. Brush, Jr. and Hau-Wong Ho, E. J. Hall (June HY6:109,111:2535) Charles G. Gunnerson (July HY7:29:2562) N. Claes H. Fischerstroem (Nov HY9:119:2665)

McLERRAN, JAMES H.

"Airphoto Interpretation for Airfield Site Location" (May AT1:73:2467)

McPHERSON, M. B.

"Generalized Distribution Network Head Loss Characteristics" (Jan HY1:75:2339)

Dsc: E. F. Trunk (May HY5:183:2489) Paul C. Constant, Jr., Marcel Bitoun, Claud C. Lomax, Joseph W. Maier and Thomas C. Miller, J. M. Robertson (July HY7:39,40,43,44,45:2562) G. C. Anderson, J. V. Radziul and P. Celenza (Aug HY8:57:2587) F. P. Linaweaver, Jr., John C. Geyer, Jerome B. Wolff (Nov HY9:127:2665)

Dsc (April HY4:121:2456) of "Hydraulic Characteristics of Gate Slots" (Oct 59 HY10:81:2224) Dsc (April HY4:111:2456) of "The Hydraulic Design of Slotted Spillway Buckets" (Oct 59 HY10:1:2200)

Dsc (Sept SA5:69:2609) of "Diffusion in a Sectionally Homogeneous Estuary" (Mar SA2:15:2408)

Dsc (Nov HY9:161:2665) with J. V. Radziul of "Friction Losses in Lines with Service Connections" (April HY4:35:2449)

Dsc (Nov SA6:96:2666) of "Oxygen Balance of an Estuary" (May SA3:35:2472)

McRAE, JOHN L.

Dsc (June SM3:84:2538) of "Structure and Strength Characteristics of Compacted Clays" (Oct 59 SM5:87:2216)

Corr: Oct SM5:141

Dsc (Dec SM6:93:2696) of "Soil Structure and the Step-Strain Phenomenon" (April SM2:1:2431)

NAGAI, SHOSHICHIRO

"Shock Pressures Exerted by Breaking Waves on Breakwaters" (June WW2:1:2504)

NEAL, B. G.

See P. S. Symonds (Jan EM1:79:2337)

NELSON, R. WILLIAM

Dsc (June IR2:73:2536) of "Laboratory Research on Interceptor Drains" (Sept 59 IR3:25:2154)

NEMEROW, NELSON L.

"Refuse Volume Reduction in a Sanitary Landfill: Twenty-sixth Progress Report, Committee on Sanitary Engineering, Sanitary Engineering Division" (Nov 59 SA6:37:2250)

Dsc: Desso T. Mitchell (May SA3:165:2490)

Clo: Nov SA6:85:2641

"Man Versus Environment: Twenty-Seventh Progress Report, Committee on Sanitary Engineering Research, Sanitary Engineering Division"

(July SA4:13:2549)

"Automatic System for Monitoring Water Quality: Twenty-Eighth Progress Report, Committee on Sanitary Engineering Research, Sanitary Engineering Division" (July SA4:25:2554)

Dsc: C. H. J. Hull (July SA4:105:2561)

"Solubility of Atmospheric Oxygen in Water: Twenty-Ninth Progress Report, Committee on Sanitary Engineering Research, Sanitary Engineering Division" (July SA4:41:2556)

NESBITT, JOHN B.

"Aerobic Metabolism of Potassium Cyanide," with H. Robert Kohl and Elmer L. Wagner, Jr. (Jan SA1:1:2341)

NEVILLE, A. M.

Dsc (Jan EM1:169:2348) of "Shrinkage, Swelling and Creep in Cement" (July 59 EM3:111:2096)

Corr: Oct EM5:185

NEWHALL, GEORGE N.

Dsc (May HY5:147:2489) with Frank M. Henry of "Mountain Channel Treatment in Los Angeles County" (Nov 59 HY11:11:2242)

NEWLAND, P. L.

Dsc (Dec SM6:99:2696) with B. H. Allely of "Fundamental Aspects of Thixotropy in Soils" (June SM3:19:2522)

NEWMARK, NATHAN M.

"A Method of Computation for Structural Dynamics" (July 59 EM3:87:2094)

Dsc: E. Rosenbluth (Jan EM1:159:2348)

NEWSON, RICHARD J.

Dsc (Aug ST8:111:2585) of "Design of Prestressed Concrete Beams by Computer" (April ST4:129:2446)

NILSON, ARTHUR H.

"Shear Diaphragms of Light Gage Steel" (Nov ST11:111:2650)

NISHIDA, YOSHICHIKA

Dsc (June SM3:102:2538) of "Compaction of Sands and Bearing Capacity of Piles" (Dec 59 SM6:1:2292)

NOBLE, CHARLES M.

Dsc (Sept HW3:62:2614) of "Passenger Data for Urban Transportation Planning" (Dec 59 HW4:37:2275)

NOMICOS, GEORGE N.

See Vito A. Vanoni (May 59 HY5:77:2020)

OBERTI, GUIDO

"Italian Arch Dam Design and Model Confirmation" (Mar ST3:1:2410)

Dsc: K. G. Harding and N. S. Trahair (Oct ST10:145:2635)

O'CONNOR, DONALD J.

"Oxygen Balance of an Estuary" (May SA3:35:2472)

Dsc: Robert V. Thomann, M. B. McPherson, C. H. J. Hull (Nov SA6:95,96,105:2666)

OGLESBY, C. H.

"Engineering Education and the Construction Industry: What the Industry Should Have from the Colleges," with John W. Fondahl (Feb 59 COI:29:1959)

- OGLESBY, C. H. Continued
 Dsc: Theodore B. Appel, Jr., Paul F. Kelm,
 Henry G. Howard (Sept 59 CO2:67,68,69:2178)
 Clo: Feb CO1:77:2377
- OJALVO, MORRIS
 "Restrained Columns" (Oct EM5:1:2615)
 Dsc (Oct EM5:169:2632) with Ahmet Cakmak of
 "Behavior of Buckled Rectangular Plates" (April
 EM2:59:2445)
- OKUN, DANIEL A.
 See James J. McKeown (Jan SA1:37:2352)
 See John E. Jenkins (July SA4:55:2557)
- OLSON, R. E.
 Dsc (Aug SM4:65:2586) with J. D. Scott of
 "Structure and Strength Characteristics of Com-
 pressed Clays" (Oct 59 SM5:87:2216)
- ONAT, E. T.
 "Plastic Analysis of Shallow Conical Shells"
 (Dec EM6:1:2675)
- ORLOB, GERALD T.
 "Eddy Diffusion in Homogeneous Turbulence"
 (Sept 59 HY9:75:2150)
 Dsc: Mikio Hino, Takashi Ichiye, Charles G.
 Gunnerson (April HY4:95,97,101:2456)
- OROS, CHARLES N.
 "Surveys at Cougar Reservoir" (July SU2:13:
 2550)
- ORVILLE, HOWARD T.
 "A Weather Modification Program for the Fu-
 ture" (Mar LRI:139:2405)
- OSPINA, CARLOS S.
 Dsc (April PO2:69:2457) of "Underground
 Power Stations in Italy" (Dec 59 PO6:63:2289)
 See Philip Z. Kirpich (Sept 59 HY9:1:2147)
- OSWALD, WILLIAM J.
 "Light Conversion Efficiency of Algae Grown in
 Sewage" (July SA4:71:2558)
- PADERI, F.
 Dsc (Aug HY8:47:2587) of "Two Methods to
 Compute Water Surface Profiles" (April 59 HY4:
 79:1997)
- PALMER, ROBERT Q.
 "Breakwaters in the Hawaiian Islands" (June
 WW2:39:2507)
 Dsc: Robert E. Hickson, J. E. Deignan (Nov
 WW4:109,115:2659)
- PAPP, REMIG A.
 Dsc (June HY6:115:2535) of "Tidal Characteris-
 tics from Harmonic Constants" (Dec 59 HY12:
 77:2317)
- PARSONS, D. A.
 "Effects of Flood Flow on Channel Boundaries"
 (April HY4:21:2443)
- PARTENSKY, HANS-WERNER
 "Waves in Navigation Canals Due to Lock Fill-
 ing" (Mar WW1:85:2422)
 Dsc: F. F. Escoffier (Sept WW3:163:2611) J.
 Th. Thijssen, W. D. Baines and H. J. Leutheusser
 (Nov WW4:105:2659)
- PASVEER, A.
 Dsc (May SA3:151:2490) of "Absorption of Oxy-
 gen from Air Bubbles" (July 59 SA4:89:2090)
- PATEL, P. C.
 See S. L. Lee (May ST5:69:2477)
- PECK, RALPH B.
 Dsc (Feb SM1:79:2391) of "Compressibility as
 the Basis for Soil Bearing Value" (Aug 59 SM4:
 11:2135)
 Dsc (Feb SM1:95:2391) of "Major Power Station
 Foundation in Broken Limestones" (Oct 59 SM5:
 77:2215)
- PEI, MING L.
 "Matrix Solution of Beams with Variable Mo-
 ments of Inertia" (Oct 59 ST8:1:2218)
 Dsc: Ray W. Clough, Steven J. Fenves (Jan
 ST1:129,132:2353) J. Szabó, E. A. Richards
 (April ST4:101,104:2458)
 Dsc (Aug ST8:91:2585) of "Orthogonal Grid-
 works Loaded Normally to their Planes" (Jan
 ST1:1:2344)
- PENZIEN, JOSEPH
 "Discontinuity Stresses in Beams on Elastic
 Foundations" (April ST4:67:2441)
 "Dynamic Response of Elasto-Plastic Frames"
 (July ST7:81:2545)
- PETCU, VALERIU
 Dsc (May ST5:135:2491) of "Analysis of Con-
 tinuous Trusses by Carry-Over Moments" (Dec
 59 ST10:27:2314)
- PETERKA, A. J.
 See G. L. Beichley (Oct 59 HY10:1:2200)
- PETERS, SIMON
 Dsc (June PO3:145:2537) of "Determination of
 Stresses on Anchor Blocks" (Dec 59 PO6:121:
 2291)
- PETERSON, DEAN F.
 "Flume Studies of Flow in Steep, Rough Chan-
 nels," with P. K. Mohanty (Nov HY9:55:2653)
- PETERSON, JAMES M.
 "Freeway Spacing in an Urban Freeway System"
 (Sept HW3:29:2596)
- PETERSON, WILLIAM C.
 Dsc (Mar HY3:77:2426) of "Revised Computa-
 tion of a Velocity Head Weighted Value" (Sept 59
 HY9:69:2149)
- PHILIP, J. R.
 Dsc (May HY5:179:2489) of "Effect of Aquifer
 Turbulence on Well Drawdown" (Nov 59 HY11:
 99:2265)
- PHILLIPS, ARIS
 "The Neutral Axis in Plastic Bending of Beams"
 (Oct 59 EM4:65:2198)
 Dsc: John C. Sprague, H. Norman Abramson
 (April EM2:175:2455)
- PHILLIPS, H. BOYD
 "Stresses Around Rectangular Openings in a
 Plate," with Ira E. Allen (June EM3:165:2519)
- PIAN, RICHARD H. J.
 Dsc (July ST7:221:2563) of "Digest of the Guide

- PIAN, RICHARD H. J. Continued
to Design Criteria for Metal Compression Mem-
bers" (April ST4:157:2450)
- PICHLER, ERNESTO
"Rock Characteristics at the Paulo Afonso
Power Plant," with Francisco Barros de Campos
(Aug 59 SM4:95:2137)
Dsc: A. A. Eremin (Feb SM1:89:2391)
- PICKETT, ELLIS B.
See Robert G. Cox (May HY5:151:2489)
- PIHLAINEN, JOHN A.
"Pile Construction in Permafrost" (Dec 59
SM6:75:2295)
Dsc: J. K. Sexton, Per Hall and D. F. Murphy
(June SM3:119,120:2538) Frederick E. Crory
(Aug SM4:87:2586)
Dsc (May CO2:43:2488) of "Ventilated Building
Foundations in Greenland" (Sept 59 CO2:23:2142)
- PINCUS, GEORGE
Dsc (Aug EM4:197:2583) with George Winter of
"Strength and Efficiency Aspects of Plate Struc-
tures" (April EM2:17:2439)
- PINKSTAFF, EUGENE
See Robert L. Davis (Feb CO1:55:2360)
- PINNELL, CHARLES
"Traffic Behavior and Freeway Ramp Design,"
with Charles J. Keese (Sept HW3:41:2604)
- PISTER, K. S.
"Bending of Plates on a Viscoelastic Founda-
tion," with M. L. Williams (Oct EM5:31:2619)
- PLUNTZE, J. C.
See R. H. Bogan (Sept SA5:1:2605)
- POLLARD, ARTHUR LEWIS
"An Unusual Deposit in a Hydraulic Tunnel,"
with Hazen Etnier House (Dec 59 PO6:163:2312)
Dsc: F. L. Lawton, William T. Walker (June
PO3:151:2537)
- PORTO, NUNO de VASCONCELOS
See Luis Henrique Gomes (Aug 58 PO4:1747)
- POPOV, E. P.
"Deflection Stability of Frames Under Repeated
Loads," with R. E. Mc Carthy (Jan EM1:61:2334)
- POSEY, CHESLEY J.
Dsc (April ST4:115:2458) of "Reinforced Con-
crete Folded Plate Construction" (Oct 59 ST8:
15:2219)
Corr: June ST6:163
See Ralph W. Powell (May 59 HY5:31:2018)
- POWELL, RALPH W.
"Resistance Experiments in a Triangular Chan-
nel," with Chesley J. Posey (May 59 HY5:31:
2018)
Corr: Nov HY9:185
Dsc: P. Ackers (Nov 59 HY11:141:2269) J. van
Malde (Dec 59 HY12:103:2271)
Clo: Nov HY9:107:2665
- PRATT, LAWRENCE F.
"Flow Losses in the Lower Gila River" (June
HY6:23:2531)
- PREISSMANN, ALEXANDRE
Dsc (May HY5:149:2469) of "Electronic Com-
puters Used for Hydrologic Problems" (Nov 59
HY11:21:2243)
- PRICE, V. E.
See A. L. Little (Dec SM6:95:2696)
- PRUGH, BYRON J.
"New Tools and Techniques for Dewatering"
(Feb CO1:11:2356)
- RAAB, N. C.
Dsc (June HW2:45:2533) of "Passenger Data for
Urban Transportation Planning" (Dec 59 HW4:37:
2275)
- RADZIUL, J. V.
Dsc (Aug HY8:57:2587) with P. Celenza of "Gen-
eralized Distribution Network Head Loss Charac-
teristics" (Jan HY1:75:2339)
See M. B. Mc Pherson (Nov HY9:164:2665)
- RAJARATNAM, N.
Dsc (July HY7:50:2562) of "The Fourth Root
n-f Diagram" (Jan HY1:63:2340)
- RANNELLS, JOHN
Dsc (Sept HW3:61:2614) of "Passenger Data for
Urban Transportation Planning" (Dec 59 HW4:37:
2275)
- RAWN, A. M.
"Diffusers for Disposal of Sewage in Sea Water,"
with F. R. Bowerman and Norman H. Brooks (Mar
SA2:65:2424)
Dsc: J. M. Jordan, Jr., C. H. Lawrance (Sept
SA5:87:2609)
- REE, FRANCIS H.
"Relaxation Theory of Creep of Metals," with
Taikyue Ree and Henry Eyring (Jan EM1:41:2333)
- REE, TAIKYUE
See Francis H. Ree (Jan EM1:41:2333)
- REE, W. O.
Dsc (April HY4:91:2456) of "Friction Factors
in Corrugated Metal Pipe" (Sept 59 HY9:69:2148)
- REESE, LYMON C.
See Hudson Matlock (Oct SM5:63:2626)
- REGGINI, H. C.
See Mario G. Salvadori (Nov ST11:141:2654)
- RENFRO, GRAHAM W.
See Charlie M. Moore (Feb HY2:69:2374)
- REYNOLDS, ROBIN R.
"The Santa Barbara Project" (Mar IR1:145:2406)
- RHONE, THOMAS J.
"Problems Concerning the Use of Low Head
Radial Gates" (Feb 59 HY2:35:1935)
Dsc: E. Pariset and B. Michel (July 59 HY7:
151:2097) J. R. Bowman (Sept 59 HY9:113:2182)
Robert G. Cox, Arthur Toch (Mar HY3:31,33:
2426)
Clo: Mar HY3:34:2426
- RICHARDS, E. A.
Dsc (April ST4:104:2458) of "Matrix Solution
of Beams with Variable Moments of Inertia"
(Oct 59 ST8:1:2218)

RICHARDSON, EDWARD ADAMS

- "The Builder of the Newport (Rhode Island) Tower" (Feb SU1:73:2383)

RICHARDSON, E. V.

- See Daryl B. Simons (May HY5:73:2485)

RICHART, F. E., JR.

- "Anchored Bulkhead Design by Numerical Method" (Feb SM1:29:2373)
- "Foundation Vibrations" (Aug SM4:1:2564)
- Dsc: D. F. Coates (Dec SM6:103:2696)

RICHOLSON, JEROME M.

- Dsc (Mar WW1:168:2419) of "A Breasting Dolphin for Berthing Supertankers" (Sept 59 WW3:183:2175)

RICHTER, RAYMOND C.

- "Artificial Recharge of Ground Water Reservoirs in California," with Robert Y. D. Chun (Dec 59 IR4:1:2281)
- Dsc: Max Suter (June IR2:85:2536)

RIDGE, S. E.

- "Highway Location and Design by Photogrammetric-Electronic Computer" (Feb SU1:67:2380)

RIESBOL, HERBERT S.

- See Francis E. Swain (Nov 59 HY11:21:2243)

RILEY, J. A.

- "Climate and Crops in Humid Areas," with P. H. Grissom (Dec IR4:107:2685)

RING, GEORGE W.

- Dsc (June HW2:41:2533) of "Pavement Design Practices in Virginia" (Sept 59 HW3:27:2145)

RITTGERS, VIRDEN A.

- Dsc (Sept HW3:68:2614) of "Passenger Data for Urban Transportation Planning" (Dec 59 HW4:37:2275)

ROBERSON, JOHN A.

- Dsc (Jan HY1:111:2349) of "Design Methods for Flow in Rough Conduits" (July 59 HY7:43:2081)

ROBERTSON, J. M.

- Dsc (May HY5:134:2489) with H. W. Bennett of "Hydraulic Characteristics of Gate Slots" (Oct 59 HY10:81:2224)
- Dsc (July HY7:45:2562) of "Generalized Distribution Network Head Loss Characteristics" (Jan HY1:75:2339)

ROBINSON, A. R.

- "Vortex Tube Sand Trap" (Dec IR4:1:2669)
- See Jack Keller (Sept 59 IR3:25:2154)

ROGERS, PAUL

- Dsc (May ST5:139:2491) of "Vierendeel Bents with Nonprismatic Members" (Dec 59 ST10:55:2321)

ROMITA, PIER LUIGI

- Dsc (Nov HY9:151:2665) of "Scour at Bridge Crossing" (Feb HY2:39:2369)

ROSENBLUETH, E.

- Dsc (Jan EM1:159:2348) of "A Method of Computation for Structural Dynamics" (July 59 EM3:67:2094)

ROSENQUIST, I. TH.

- "Physico-Chemical Properties of Soils: Soil-Water Systems" (April 59 SM2:31:2000)
- Dsc: Alan S. Michaels (April 59 SM2:91:2010)
- Clo: Feb SM1:75:2391

ROWE, R. E.

- See G. D. Base (Sept ST9:1:2608)

ROWE, ROBERT S.

- See Ervin Hegedus (April SM2:63:2448)

RUDDY, JOHN M.

- "Alpha-Gamma "Hot" Cells for Entry by Personnel" (Oct 59 ST8:125:2239)
- Dsc: Robert F. Borg (Jan ST1:137:2353)

RUMPF, JOHN L.

- See Robert T. Foreman (June ST6:73:2523)

RUSKIN, JOHN H.

- Dsc (April PO2:63:2457) of "American Power-Plant Cooling Towers" (Oct 59 PO5:119:2228)

RYDER, FREDERICK L.

- "Electrical Energy Analogs of Vibrating Beams" (Oct EM5:45:2620)
- See M. Zaid (Jan EM1:1:2331)

SALVADORI, MARIO G.

- "Periods of Framed Buildings for Earthquake Analysis," with Ewald Heer (Dec ST12:59:2680)
- "Simply Supported Corner Plate," with H. C. Reggini (Nov ST11:141:2654)
- "Waves and Shocks in Locking and Dissipative Media," with Richard Skalak and Paul Weidinger (April EM2:77:2447)
- See H. H. Bleich (Oct 59 ST8:91:2223)
- See Melvin L. Baron (June EM3:153:2516)
- See P. Gondikas (Oct EM5:13:2616)

SAMI, SABRI

- "Continuous Girder Bridge with Variable Moment of Inertia" (Jan ST1:19:2346)
- Corr: May ST5:145:2491
- Dsc: Keiichi Hayashi, Narbey Khachaturian (May ST5:145:2491) A. A. Eremin (July ST7:215:2563) Valerian Leontovich (Aug ST8:93:2585)

SAMMONS, WILLIAM

- Dsc (Feb HY2:107:2381) of "Determination of Hydrologic Frequency Factor" (July 59 HY7:93:2084)
- Corr: May HY5:119:2489

SANDHU, R. S.

- "Simplified Procedure for Stress Analysis of Gravity Dams" (Dec 59 PO6:173:2313)
- Dsc: G. S. Sarkaria (June PO3:155:2537)

SANGSTER, WILLIAM M.

- "Pressure Changes at Open Junctions in Conduits," with Horace W. Wood, Ernest T. Smerdon, and Herbert G. Bossy (June 59 HY6:13:2057)
- Dsc: John C. Geyer (Oct 59 HY10:157:2235)
- Fred W. Blalidsell and Philip W. Mason (Nov 59 HY11:153:2269)
- Clo: May HY5:117:2489

SANTRY, I. W., JR.

- See R. S. Murphy (Nov SA6:1:2641)

SARKARIA, G. S.

- "Quick Design of Air Vents for Power Intakes,"

- SARKARIA, G. S. Continued
with O. S. Hom (Dec 59 PO6:15:2286)
Corr: April PO2:87:2457
Dsc (June PO3:155:2537) of "Simplified Procedure for Stress Analysis of Gravity Dams" (Dec 59 PO6:173:2313)
- SARPKAYA, TURGUT
"Added Mass of Lenses and Parallel Plates" (June EM3:141:2511)
- SAVILLE, THORNDIKE, JR.
Dsc (Sept WW3:151:2611) of "Laboratory Investigation of Rubble-Mound Breakwaters" (Sept 59 WW3:93:2171)
- SAWYER, CLAIR N.
"Fundamental Considerations in High-Rate Digestion," with Jay S. Grumbly (Mar SA2:49:2411)
Dsc: F. Sulzer, C. E. Keefer (Sept SA5:81,83:2609) M. T. Garrett, Jr. (Nov SA6:89:2666)
- SAWYER, D. A.
"Various Instability Modes of the Fixed Base Column" (July ST7:61:2544)
Dsc: Marvin A. Larson (Oct ST10:155:2635)
- SAWYER, HERBERT A., JR.
See Lawrence P. Johnson, Jr. (Dec 58 ST8:1879)
- SBAROUNIS, JOHN A.
"Analysis of a Two Way Truss System," with Michael F. Gaus (Feb 59 ST2:45:1940)
Corr: June 59 ST6:102:2075
Dsc: David Dario Brillembourg Bravo, R. Schjodt (June 59 ST6:97,99:2075)
Clo: Mar ST3:29:2427
- SCAROLA, J. A.
"American Power-Plant Cooling Towers" (Oct 59 PO5:119:2228)
Dsc: John H. Ruskin (April PO2:63:2457)
- SCHAEFER, VINCENT J.
"Serendipity and the Development of Experimental Meteorology" (Mar IRI:1:2393)
- SCHEIDENHELM, F. W.
"Montgomery Dam-Rockfill with Asphaltic Concrete Deck," with John B. Snethlage and Arthur N. Vanderlip (Feb 58 PO1:1556)
Dsc: G. R. Scott, J. L. Sherard (Oct 59 PO5:135,137:2238)
Clo: Feb PO1:59:2392
See John B. Snethlage (April 59 PO2:73:2013)
- SCHIFF, S. C.
Dsc (June SM3:95:2538) of "Compaction of Sands and Bearing Capacity of Piles" (Dec 59 SM6:1:2292)
- SCHIFFMAN, ROBERT L.
"Engineering Education and the Construction Industry: Modern Trends in Construction Engineering Education" (Feb 59 CO1:13:1956)
Dsc: William Hershseder, Henry G. Howard (Sept 59 CO2:59,60:2178)
Clo: May CO2:39:2488
- SCHLUF, J. B.
"Generalities on Coastal Processes and Protection" (Mar 59 WW1:1:1976)
Dsc: R. Silvester (Sept 59 WW3:287:2184)
Clo: Mar WW1:147:2419
- SCHMIDT, MILTON O.
"Highway and Bridge Surveys: Preliminary Bridge Surveys: Progress Report, Committee on Highway and Bridge Surveys, Surveying and Mapping Division" (Nov 58 SU3:1842)
Dsc: R. Robinson Rowe, Woodland G. Schockley, John A. Focht, Jr., David M. Greer, Ralph F. Reuss, E. J. Zagarra (Sept 59 SU1:31,32,35,36:2183)
Clo: Feb SU1:99:2385
- SCHNEIDER, FLOYD E.
Dsc (Nov ST11:167:2667) of "Design Considerations for Fatigue in Timber Structures" (May ST5:15:2470)
- SCHROEDER, KENNETH B.
See Joe M. Lara (Sept 59 HY9:69:2149)
See Joe M. Lara (April HY4:79:1997)
- SCHUREMAN, L. R.
"The Electronic Computer in Highway Engineering" (Sept 59 HW3:37:2146)
Dsc: Charles E. Carlson (Mar HW1:77:2418)
Clo: Dec HW4:27:2694
- SCHWENDLER, R. G.
See W. J. Brignac (June EM3:41:2499)
- SCIAMMARELLA, CESAR A.
See Stanley Morse (Aug EM4:105:2576)
- SCORDELIS, A. C.
"A Matrix Formulation of the Folded Plate Equations" (Oct ST10:1:2617)
- SCOTT, G. R.
Dsc (Oct 59 PO5:135:2238) of "Montgomery Dam - Rockfill with Asphaltic Concrete Deck" (Feb 58 PO1:1556)
Corr: Feb PO1:63:2392
- SCOTT, J. D.
See R. E. Olson (Aug SM4:65:2586)
- SCOTT, N. L.
"Additional Aspects of the Enrico Fermi Atomic Power Plant," with R. F. Mantey (Feb PO1:39:2375)
- SCRIVNER, L. R.
"Digital Computers for Trial-Load Analysis of Arch Dams" (Aug PO4:1:2568)
- SEED, H. B.
"Structure and Strength Characteristics of Compacted Clays," with C. K. Chan (Oct 59 SM5:87:2216)
Dsc: I. da Silveira, O. H. Gilbert, Jr., John L. McRae (June SM3:77,81,84:2538) R. E. Olson and J. D. Scott (Aug SM4:65:2586)
- SEIDEL, HARRIS F.
Dsc (July SA4:97:2561) of "Role of Price in the Allocation of Water Resources" (Jan SA1:15:2343)
- SELIG, ERNEST T.
"Underground Structures Subject to Air Overpressure," with Keith E. McKee and Eben Vey (Aug EM4:87:2575)
Corr: Oct EM5:185

SEMENZA, CARLO

See Dante Finzi (Dec 59 PO6:63:2289)

SERATA, SHOHEI

"Design Principles for Underground Salt Cavities," with Earnest F. Gloyna (May SA3:1:2468)

SEXTON, BURTON H.

Dsc (June HW2:48:2533) of "Passenger Data for Urban Transportation Planning" (Dec 59 HW4:37:2275)

SEXTON, J. K.

Dsc (June SM3:119:2538) of "Pile Construction in Permafrost" (Dec 59 SM6:75:2295)

SHAW, W. A.

See G. R. Swihart (Jan 59 ST1:43:1910)

SHEER, ALFRED C.

Dsc (Feb SM1:86:2391) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)

SHELDON, ROBERT C.

Dsc (July SU2:37:2560) of "Status of Surveying and Mapping in the United States: Final Report, Task Committee on Status of Surveying and Mapping, Surveying and Mapping Division" (Sept 59 SU1:9:2166)

SHERLOCK, ROBERT H.

"Wind Forces on Structures: Nature of the Wind" (July 58 ST4:1708)
Dsc: Arthur N. Gilbert (Dec 58 ST8:17:1882)
Jacob Feld (Jan 59 ST1:135:1922) Herbert S. Safir, W. R. Schriever, Donald C. Bunting, R. C. Gentry, A. G. Davenport, Henri Perrin, C. Scruton (Mar 59 ST3:169,170,172,179,180:1988)
Clo: July ST7:197:2563
Corr: Oct ST10:163

SHERMAN, JOHN

"Laterally Deflected Columns" (Oct 59 ST8:45:2221)
Dsc: A. A. Eremin, Benjamin Koo (April ST4:117:2458)
Clo: Nov ST11:157:2667

SHOOK, JAMES F.

"Construction Materials Control for the AASCHO Road Test" (Oct 59 SM5:15:2211)
Dsc: Edward A. Abdun-Nur (Feb SM1:91:2391)
Clo: Oct SM5:123:2636

SIECKE, KURT H.

Dsc (April SM2:81:2459) of "Compressibility as the Basis for Soil Bearing Value" (Aug 59 SM4:11:2135)

SILVA, F. P.

Dsc (June SM3:72:2538) of "Rate of Constructing Embankments on Soft Foundation Soils" (Oct 59 SM5:61:2214)

SILVESTER, RICHARD

"Engineering Aspects of Coastal Sediment Movement" (Sept 59 WW3:11:2168)
Dsc: R. G. Dean and P. S. Eagleson (June WW2:119:2540)

SIMMONS, W. P., JR.

"Models Primarily Dependent on the Reynolds Number" (June HY6:59:2531)

Dsc (May HY5:162:2489) of "Hydraulic Down-pull Forces on High Head Gates" (Nov 59 HY11:39:2245)

SIMONS, DARYL B.

"Resistance to Flow in Alluvial Channels," with E. V. Richardson (May HY5:73:2485)
"Uniform Water Conveyance Channels in Alluvial Material," with Maurice L. Albertson (May HY5:33:2484)

SIMPSON, HAWLEY S.

Dsc (Sept HW3:64:2614) of "Passenger Data for Urban Transportation Planning" (Dec 59 HW4:37:2275)

SIMPSON, W. C.

"Epoxy Asphalt Concrete for Airfield Pavements," with H. J. Sommer, R. L. Griffin, and T. K. Miles (May AT1:57:2466)

SIMS, JAMES R.

See Bayliss C. Mc Innis (April EM2:179:2455)

SKALAK, RICHARD

See Mario G. Salvadori (April EM2:77:2447)

SLICHTER, FRANCIS B.

Dsc (Mar WW1:156:2419) of "Laboratory Investigation of Rubble-Mound Breakwaters" (Sept 59 WW3:93:2171)

SLOAN, GARRETT

Dsc (May SA3:167:2490) of "Waste Water Reclamation for Golf Course Irrigation" (Nov 59 SA6:79:2252)

SMERDON, ERNEST T.

See William M. Sangster (June 59 HY6:13:2057)

SMIRNOFF, MICHAEL V.

Dsc (July SU2:33:2560) of "Status of Surveying and Mapping in the United States: Final Report, Task Committee on Status of Surveying and Mapping, Surveying and Mapping Division" (Sept 59 SU1:9:2166)

SMITH, AUSTIN B.

"Southwest Pass-Mississippi River 40-ft Channel" (Sept WW3:129:2606)

SMITH, C. D.

Dsc (Aug HY8:75:2587) of "Hood Inlet for Closed Conduit Spillways" (May HY5:7:2478)

SMITH, E. A. L.

"Pile-Driving Analysis by the Wave Equation" (Aug SM4:35:2574)
Corp: Oct SM5:142
Dsc: L. O. Soderberg, Marvin Gates (Dec SM6:105,107:2696)

SMITH, J. R.

See W. H. Campen (Dec HW4:40:2694)

SMITH, ROBERT LEE

"This Problem of Water Rights" (Dec 59 IR4:29:2282)
Dsc: Robert O. Thomas (June IR2:87:2536)

SMITH, R. W.

"Longitudinal Distribution of Wheel Loads on a Runway," with R. Horonjeff (Oct 59 AT4:1:2189)
Dsc: R. G. Ahlvin (May AT1:93:2486)

- SMITH, THEODORE B.
 "Physical Studies of Santa Barbara Storms"
 (Mar IR1:21:2395)
- SMITH, WILBUR S.
 "Analyzing and Projecting Travel Data" (June HW2:1:2513)
 Dsc: Robert L. Morris, James S. Burch (Dec HW4:55:2694)
- SNETHLAGE, JOHN B.
 "Rockfill Dams: Review and Statistics," with F. W. Scheidenhelm and Arthur N. Vanderlip (Aug 58 PO4:1739)
 Dsc: F. L. Lawton (April 59 PO2:73:2013)
 G. Robert Koch (Oct PO5:13:2631)
 Clo: Feb PO1:81:2392, June PO3:107:2537, Oct PO5:15:2631
 Corr: Oct PO5:37
 See F. W. Scheidenhelm (Feb 58 PO1:1556)
- SNYDER, WILLARD M.
 "Hydrologic Studies by Electronic Computers in TVA" (Feb HY2:1:2362)
 Dsc: J. L. Kovner (Aug H18:67:2587)
- SOBOTKA, ZDENĚK
 Dsc (May ST5:113:2491) of "Bending Moments on Shell Boundaries" (Oct 59 ST8:91:2223)
 Corr: Sept ST9:35
- SODERBERG, L. O.
 Dsc (Dec SM6:105:2696) of "Pile-Driving Analysis by the Wave Equation" (Aug SM4:35:2574)
- SOMMER, H. J.
 See W. C. Simpson (May AT1:57:2466)
- SPANN, WILLIAM M.
 Dsc (July SU2:34:2560) of "Status of Surveying and Mapping in the United States: Final Report, Task Committee on Status of Surveying and Mapping, Surveying and Mapping Division" (Sept 59 SU1:9:2166)
- SPENCER, R. W.
 "Cooling Water for Steam Electric Stations on Tidewater," with John Bruce (June PO3:1:2503)
- SPRAGUE, JOHN C.
 Dsc (April EM2:175:2455) of "The Neutral Axis in Plastic Bending of Beams" (Oct 59 EM4:65:2198)
- STAMATOPOULOS, ARIS C.
 "Linearly Variable Load Distribution on a Rectangular Foundation" (Dec 59 SM6:137:2320)
 Dsc: N. N. Ambraseys (June SM3:123:2538)
 Clo: Dec SM5:91:2696
- STANLEY, ALBERT A.
 Dsc (July SU2:36:2560) of "Status of Surveying and Mapping in the United States: Final Report, Task Committee on Status of Surveying and Mapping, Surveying and Mapping Division" (Sept 59 SU1:9:2166)
- STEELE, I. C.
 "Rockfill Dams: Salt Springs and Lower Bear River Concrete Face Dams," with J. Barry Cooke (Aug 58 PO4:1737)
 Dsc: Carlos Tercero, Geoffrey Davey, Masatoshi Kawase, Tatsuo Mizukoshi, F. L. Lawton (April 59 PO2:49,52,59,69:2013) C. M. Roberts (Dec 59 PO6:199:2328) Karl Terzaghi (Feb PO1:65:2392)
 Clo: Dec 59 PO6:203:2328, Feb PO1:74:2392
- STEIN, MANUEL
 "Behavior of Buckled Rectangular Plates" (April EM2:59:2445)
 Dsc: Morris Ojalvo and Ahmet Cakmak (Oct EM5:169:2632)
- STEIN, MURRAY
 "Proposed Changes in Eastern Water Use Policies" (Sept 58 SA5:1777)
 Dsc: Thomas R. Camp (Nov 58 SA6:1855) Samuel A. Greeley (Jan 59 SA1:33:1921) Howard M. Turner (Mar 59 SA2:113:1985) Thomas M. Stetson (May 59 SA3:83:2044)
 No clo: May SA3:149:2490
- STEINBERG, ISRAEL H.
 "Russian River Channel Works" (Nov WW4:17:2647)
 Dsc (Mar HY3:75:2426) of "Revised Computation of a Velocity Head Weighted Value" (Sept HY9:69:2149)
- STEPHENS, B. H., JR.
 See John C. Brough, Jr. (Oct ST10:87:2630)
- STEPHENS, L. F.
 Dsc (Dec EM6:109:2691) of "Experimental Study of Beams on Elastic Foundations" (June EM3:107:2505)
- STETSON, EDWARD D.
 See William L. Berry (Sept 59 IR3:97:2160)
- STEVENS, HENRY W.
 Dsc (June SM3:65:2538) with William P. Ver-ville of "Subsurface Explorations in Permafrost Areas" (Oct 59 SM5:31:2212)
- STEVENS, JOHN C.
 Dsc (June HY6:107:2535) of "The Vortex Chamber as an Automatic Flow-Control Device" (Dec 59 HY12:1:2310)
 Dsc (July HY7:35:2562) of "Early History of Hydrometry in the United States" (Jan HY1:1:2335)
- STEWART, J. W.
 See W. C. Walton (Sept 59 LR3:49:2156)
- STOLL, U. W.
 "Computer Solution of Pressure Distribution Problem" (Dec SM6:1:2670)
- STONE, RALPH
 Dsc (Mar SA2:107:2425) of "Waste Water Reclamation for Golf Course Irrigation" (Nov 59 SA2:125:2425)
- STOUT, GLENN E.
 "Natural Variability of Storm, Seasonal, and Annual Precipitation" (Mar IR1:127:2404)
- STRAUB, CONRAD P.
 "Treatment of Liquid Radioactive Wastes" (Jan 59 SA1:61:1930)
 Clo: Jan SA1:31:2352
- STUESSI, F.
 "Theory and Test Results on the Fatigue of Metals" (Oct 59 ST8:65:2222)
 Dsc: W. H. Munse (April ST4:119:2458)

STUMM, WERNER

"Investigation on the Corrosive Behavior of Waters" (Nov SA6:27:2657)

SU, HSUAN-LOH

"Electric Analog for Triangulation Adjustment" (Feb SU1:43:2370)

Dsc (Jan EM1:163:2346) of "Commentary on Plastic Design in Steel: Basic Concepts: Progress Report No. 1, Joint WRC-ASCE Committee on Plasticity Related to Design, Engineering Mechanics Division" (July 59 EM3:1:2091)

Dsc (Jan EM1:167:2348) of "Commentary on Plastic Design in Steel: General Provisions and Experimental Verification: Progress Report on Plasticity Related to Design, Engineering Mechanics Division" (July 59 EM3:27:2092)

SUDMAN, GLENN F.

"Rockfill Dams: Kajakai Central Core Dam, Afghanistan" (Aug 58 PO4:1735)

Dsc: F. L. Lawton (April 59 PO2:45:2013)

Clo: June PO3:105:2537

SULZER, F.

Dsc (Sept SA5:81:2609) of "Fundamental Considerations in High-Rate Digestion" (Mar SA2:49:2411)

SUTER, MAX

Dsc (Feb SM1:97:2391) of "Investigation of Underseepage-Mississippi River Levees" (Aug 59 SM4:41:2136)

Dsc (April SM2:124:2459) of "Design of Underseepage Control Measures for Dams and Levees" (Oct 59 SM5:129:2217)

Dsc (June IR2:85:2536) of "Artificial Recharge of Ground Water Reservoirs in California" (Dec 59 IR4:1:2281)

SUTTON, GEORGE H.

See Walter C. Beckmann (July SU2:19:2553)

SUTTON, JOHN G.

"Installation of Drain Tile for Subsurface Drainage" (Sept IR3:27:2591)

Dsc (June IR2:79:2536) of "Laboratory Research on Interceptor Drains" (Sept 59 IR3:25:2154)

SWAIN, FRANCIS E.

"Electronic Computers Used for Hydrologic Problems," with Herbert S. Riesbol (Nov 59 HY1:21:2243)

Dsc: Alexandre Preissmann (May HY5:149:2489)

Dsc (Oct ST10:147:2635) of "The Impact of Computers on Engineering Education" (April ST4:1:2428)

SWIGER, W. F.

"Control of Ground Water in Excavation" (Feb CO1:41:2359)

"Major Power Station Foundation in Broken Limestones," with H. M. Estes (Oct 59 SM5:77:2215)

Dsc: Ralph B. Peck (Feb SM1:95:2391)

SWIHART, G. R.

"Elastic Resistance of Reinforced Concrete Beams," with J. R. Allgood and W. A. Shaw (Jan 59 ST1:43:1910)

Dsc: F. T. Mavis (Sept 59 ST7:53:2152)

Clo: Feb ST2:67:2390

SYMONDS, P. S.

"Travelling Loads on Rigid-Plastic Beams," with B. G. Neal (Jan EM1:79:2337)

SZABO, J.

Dsc (April ST4:101:2458) of "Matrix Solution of Beams with Variable Moments of Inertia" (Oct 59 ST8:1:2218)

SZECHY, CHARLES

Dsc (June 95:2538) of "Compaction of Sands and Bearing Capacity of Piles" (Dec 59 SM6:1:2292)

SZIDAROVSKY, JOHN

"Corrected Deflection Theory of Suspension Bridges" (Nov ST11:25:2638)

SZILARD, RUDOLPH

"Design of Prestressed Composite Steel Structures" (Nov 59 ST9:97:2262)

Dsc: Sven H. Wichman (May ST5:127:2491)

Edward Cohen and A. W. Coutris (June ST6:141:2539)

TALL, LAMBERT

See Lynn S. Beedle (July ST7:139:2555)

TASKINOGLU, NABI

Dsc (May ST5:133:2491) of "Cut-Off Points for Cover Plates" (Dec 59 ST10:21:2308)

TAYLOR, A. W.

"Physico-Chemical Properties of Soils: Ion Exchange Phenomena" (April 59 SM2:19:1999)

Dsc: Philip F. Low (April 59 SM2:79:2010)

J. Amoroso (Oct 59 SM5:171:2236)

Clo: Feb SM1:73:2391

TAYLOR, JIM C.

See Desi D. Vasarhelyi (Oct ST10:23:2621)

TAYLOR, R. HUGH

Dsc (Feb HY2:115:2381) with John F. Kennedy of "Roll Waves and Slug Flows in Inclined Open Channels" (July 59 HY7:99:2085)

TEBOW, HENRY J.

Dsc (July HY7:55:2562) of "Conservancy Districts as Flood Control Organizations" (April HY4:1:2429)

TERZAGHI, KARL

Dsc (Feb PO1:65:2392) of "Rockfill Dams: Salt Springs and Lower Bear River Concrete Face Dams" (Aug 58 PO4:1737)

Dsc (Feb PO1:89:2392) of "Rockfill Dams: Wishon and Courtright Face Dams" (Aug 58 PO4:1746)

TERZIAN, K. YERVANT

Dsc (June EM3:185:2532) of "Laterally Loaded Thin Flat Plates" (Oct 59 EM4:77:2199)

TEWINKEL, G. C.

"Civil Engineering Curriculum for Federal Surveying and Mapping" (Feb SU1:113:2387)

THLJSSE, J. TH.

Dsc (Nov WW4:105:2659) of "Waves in Navigation Canals Due to Lock Filling" (Mar WW1:85:2422)

THIRUVENGADAM, A.

Dsc (April HY4:127:2456) of "Cavitation Damage

- THIRUVENGADAM, A.** Continued
 of Roughened Concrete Surfaces" (Oct 59 HY11:1:2241)
 Dsc (April HY4:121:2456) of "Hydraulic Characteristics of Gate Slots" (Oct 59 HY10:81:2224)
 Corr: July HY7:57
- THOLIN, A. L.**
 "The Hydrology of Urban Runoff," with Clint J. Keifer (Mar 59 SA2:47:1984)
 Dsc: P. O. Wolf (Aug 59 HY8:119:2138) M. B. McPherson and M. Joseph Willis, Paul Bock, Carl F. Izzard and Charles Armentrout (Sept 59 SA5:39,43,53:2181)
 Clo: A. L. Tholin, Clint J. Keifer (Mar SA2:109,112:2425)
- THOM, H. C. S.**
 "Distributions of Extreme Winds in the United States" (April ST4:11:2433)
 Dsc: J. Lieblein (Nov ST11:161:2667)
- THOMAIDES, SPIRO S.**
 See Glen V. Berg (April EM2:165:2455)
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- Waterways Experiment Station plans rebuilding after fire Dec. 90

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